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ABSTRACT

This study was designed to observe, record, and describe the interface between educational facilities and learning climate in three elementary schools, comparing the results with results from a 1990 study. Data came from taped informal interviews, videotape recordings, observations, and conversations with parents, teachers, and administrators. Study instruments included the Classroom Spatial Utilization and Migration Observation Form and the Teachers' Educational Facility Perception Questionnaire. Data analysis indicated that school facility had a definite impact on total learning climate. Specific physical features (space, equipment, maintenance, appearance, comfort, and general physical arrangement) had the ability to positively or negatively impact learning climate. Teachers had specific preferences regarding safety, aesthetic, instructional, and equipment features of their classroom. Results found that architectural features and general schematic arrangements relative to the physical location of the school could affect the learning climate in the area of safety and aesthetics. The open space (pod) design negatively impacted the learning climate in the area of comfort and space. Student movement in the classroom and school was affected by available space, learning centers, equipment, and other materials. Space outside the building had to be properly allocated for the ingress and ingress of vehicles and loading and unloading of students to ensure safety at all times. (SM)

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ED 472 268

INTERFACE BETWEEN EDUCATIONAL FACILITIES AND LEARNING CLIMATE IN THREE NORTHERN ALABAMA K-2 ELEMENTARY SCHOOLS

by

A. C. YIELDING

A DISSERTATION

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Submitted in partial fulfillment of the requirements for
the degree of Doctor of Education in the Area of
Professional Studies in the Graduate School of
The University of Alabama

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I also wish to thank Sherri and Andy Edwards for their extra efforts and assistance throughout the doctoral program. To Marilyn McCracken, secretary in the Area of Educational Administration and Leadership, who always displayed confidence in me, I wish to express sincere appreciation.

This study is dedicated to my wife Geray; my children, Billie Rachell, Aaron C., Jeanette, Janelle, Richard, and

Tami. I also dedicate this study to my sons-in-law, Danny Brown and Douglass Summers for their understanding and support throughout my years of graduate work.

Weinstein (1979) reported that in spite of the large body of research on the influence of the physical environment on students, the "solid proof" does not exist as yet of that relationship. The role of the school facility on the educational process is beginning to be better defined, but more research needs to take place to bring this relationship into focus.

Statement of the Problem

Recent studies have been completed which analyzed the interface between educational facilities and learning climate; however, no such studies have been conducted in the state of Alabama or in an Alabama school district.

Present-day schools, many of which were built between 1900 and 1930, are in need of facelifts, new furniture, new systems and designs, upgraded classrooms, outdoor ecological landscapes for learning, technology zones, spaces for art and design to occur, hallways as art galleries, places for hands-on studio design and building experiences: areas where children can contribute to or create a sense of ownership and participation (Taylor & Gousie, 1988). It is in this context that active research needs to be accomplished into the interface between educational facilities and learning climate. The need to understand more accurately that school buildings may do more than simply house the instructional program should exist among educators.

task force was to translate the theoretical learning concepts into actual practice (Jolivet, 1988).

The Interface Profile (Hawkins & Overbaugh, 1988) presents six major areas of interface between facility and learning. Each of the interface areas, evolving from the input from the two forces, focuses on features that strengthen the educational soundness and learning climate of a school building. The profile indicates that student learning and positive climate are enhanced when the facility:

> 1. Is an integral part of the community reflecting--community pride; community involvement; and broad utilization.
> 2. Is adaptable to the users' needs through--a controllable physical environment; provision for varied and ample storage; flexible instructional space for teaching and learning styles; walls, floor, fenestration serving and learning process.
> 3. Permits teachers to function as professionals with--reasonable control of the learning environment; space which permits related dialogue; appropriate space for preparation for instruction; motivational environment conducive to professionalism.
> 4. Fosters communication--through the appropriate use of technology; through the use of "learning surfaces"; about the school at points of entry; that emphasizes students achievement; that is demonstrated as important to students.
> 5. Creates an appropriate behavior setting--with emphasis on aesthetics; which encourages student interaction; which provides a stimulating atmosphere for learning; that is a comprehensive laboratory for learning.
> 6. Accommodates a variety of learning styles--through hands-on experiences resulting from building design; which fosters fine arts appreciation; resulting from student interaction; through well designed and equipped space; related to individual needs and interest. (p. 7)

design, and sociology. The Interface Project called attention to the need to study in depth the relationship between school facilities and student learning, to examine the interface between the school facility and the learning process (Jolivet, 1988; Viadero, 1990).

An educational facility (Knezevich, 1984) may be perceived as a controlled environment that enhances the teaching-learning process while it protects the physical well-being of occupants. Caudill (1954) suggested that school planning starts and ends with the pupil and that the building should be designed to satisfy the pupils' physical and emotional needs. Physical needs are met by insuring a safe structure, adequate sanitary facilities, a balanced visual environment, an appropriate thermal environment, a satisfactory acoustical environment, and sufficient shelter space for work and play. Emotional needs are met by creating pleasant surroundings, a friendly atmosphere, and an inspiring environment. This humanistic, pupil-oriented approach to school planning and construction views design and equipment as a means of enhancing the pupil's learning and comfort (Knezevich, 1984).

In December 1987, a second task force met with the Texas A & M Interface Task Force. It was identified as the National Interface Task Force. This group consisted of more than a dozen professional educational facility planners from the United States and Canada. The responsibility of this physical environment and student interest, performance, and learning (Jolivet, 1988).

Taylor and Gousie (1988) wrote that in its present state, the architecture and physical setting of most schools in the United States are in a deplorable condition, often outmoded and based on designs and philosophies of yesteryear. Even new schools, though updated, are still being designed in an outmoded format repeating the egg crate, closed classroom design of 200 years ago. As such, the American school, an environment in which children spend a large share of their time, leaves little room for self-expression and sense of ownership or involvement. "There cannot be separation between the learning process and the physical environment--they are integral parts of each other" (p. 23).

The Interface Project was initiated by Harold Hawkins of Texas A & M University following a review of the literature on the research that had been conducted on the relationship between school facilities and student learning. During 1987, an interdisciplinary group of university faculty from Texas A & M University identified the learning theory relevant to the study of the interface between the school facility and the learning process. Known as the Texas A & M Interface Task Force, it consisted of representatives from educational administration, educational psychology, curriculum and instruction, environmental some degree affects one's daily activity or routine" (p. 13), became the focal point for initiating the group's research. Lowe (1992) defined the term "learning climate" as variables found within educational environments that effectively or ineffectively accommodate positive teaching and learning. These variables may be physical as well as psychological and tend to be associated with the feelings and perceptions of all member stakeholders.

In the past, the term "school climate" was associated with organizational climate or organizational environment that concerned itself with the professional aspects and social relationships among the faculty and staff. Today, more writers are using the terms "school climate" and "learning climate" to be associated with the learning and achievement of students rather than interaction between teachers and supervisors.

During this decade there have been critical reviews of the nation's schools. One that generated much discussion was "A Nation at Risk" (1983). The Governors' Report on Education (emanating from "Action for Excellence" 1983) also addressed several categories of concern. Governors of some states have initiated reforms in response to various elements in the report. With this resurgence of interest in education and the recognition of a need to build more classrooms and schools, it is perceived that there has been inadequate attention given to the relationship between the toward school. Certainly, it is not the most important factor. It is, however, a factor that those who are influential in the design and maintenance of school facilities can control. It makes sense, therefore, to make a more concerted effort to identify the physical characteristics that have a positive effect on the learning environment. Schools should then be designed according to these characteristics. Such positive influences on the cognitive or the affective domain of the learning environment can be a factor in promoting a positive attitude toward school. It may thus be considered to have an indirect motivational effect on learning and, consequently, on achievement.

Halpin and Croft (1962) conducted a study on "organizational climate" in schools. They dealt with the "social component" of the organizational climate. Hoyle (1977) conducted a study titled "Organizational and Spatial Characteristics of Urban Learning Environments." In this study, Hoyle used the terms "learning climate," "learning environments," "classroom climate," and "school climate." Baskerville (1981) wrote that recently a study group at the University of Nebraska-Lincoln was formed for the purpose of defining "climate" and the role it plays in the lives of educational administrators, professional educators, and students. "Room temperature" and "seasonal weather" were by-passed as inadequate for the study. "Conditions which to

CHAPTER I

INTRODUCTION

Research in disciplines such as educational psychology and sociology produced linkages between the instructional environment and learning. The inclusion of these findings in professional journals led educators to seek environments that could (1) accommodate specific teaching tasks and (2) assure that design features were congruent with the physical stature of the children. The acceptance of the theory that environmental factors (e.g., color schemes, lighting, and the like) influenced learning, however, did not occur spontaneously. Historical depictions verify that until approximately 1950, the school building was given little consideration as a potential facilitator of effective teaching. After World War II and during the early 1960s, the association of environment and learning emerged as a more cogent planning consideration (Kowalski, 1989). During that era, Leu (1965) wrote the following:

> Recent school buildings reflect an increasing concern with the environmental effects of the physical space on teaching and learning. School buildings are being scaled to the ages, interests, and behavioral traits of children. (p. 5)

Faust (1980) wrote that the school building has been identified as a factor in determining students' attitude

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Purpose of the Study

The first purpose of this study was to observe, record, and describe the interface between educational facilities and learning climate in three north Alabama elementary schools. A second purpose of this study was to compare and contrast the results of this study with the research completed by Lowe (1990) that was titled "The Interface Between Educational Facilities and Learning Climate in Three Elementary Schools." This research study utilized the same approach and similar instrumentation that was employed in the Lowe study. The study is, therefore, a model of the Lowe study, except for the analysis that compared and contrasted the differences that existed in two distinct environments.

The purpose of the Lowe (1990) study was to observe, record, and describe the interface between educational facilities and learning climate in three elementary schools of the Palestine Independent School District, Palestine, Texas. Guided primarily by methods of naturalistic inquiry, the researcher conducted observation, interviews, and perception assessments on each of the three campuses during the spring of 1989. The research was an attempt to gain insights into the question posed below:

> How do the following physical characteristics of the facility impact the learning climate of the school?

1. Building age

2. Building design and appearance
3. Building square footage
4. Size and organization of instructional space
5. Building maintainability
6. Location

Data for the study were obtained through the use of taped informal interviews, video tape recordings, information observations, and general conversations with parents, teachers, and administrators. Two forms of instrumentation were developed by the researcher in order to enhance the collection of data.

The Classroom Spatial Utilization and Migration Observation Form was developed by the researcher to enhance the observation of classroom spatial organization and movement patterns of students and teachers within a specific instructional space. The information gathered through this instrumentation illustrated the percentage of use of the various classroom areas as well as the volume of use over time.

The Teachers' Educational Facility Perception Questionnaire was developed by the researcher to assess the feelings of teachers concerning the school building in which they taught. Results of the study provided the following insights into the six components of the research question:

1. Building age, when considered alone, did not appear to impact the learning climate.

2. Design and appearance of the facility appeared to impact learning climate.
3. Building square footage seemed to have a marginal impact upon school learning climate.
4. Size and organization of instructional space had a major impact upon the learning climate of a school.
5. Building maintainability appeared to impact learning climate.
6. Results of the study imply that campus location has a significant impact upon learning climate.

Significance of the Study

In colonial America, schools were little more than shelters. Urbanization, expanding curricula, creation of state departments of education, reorganization of schools, the infusion of technology, and the inclusion of architects in planning exemplify factors that contributed to a new philosophy about school buildings (Kowalski, 1989).

This study presents research concerning the interface between educational facilities and learning climate to persons responsible for the planning, designing, and utilization of school buildings.

Results of this research could possibly increase the generalizability of results from similar studies, especially the one conducted by Lowe (1990). Results of the study may also be used by principals, teachers, and others in the development of plans and specifications for the renovation or construction of facilities that house children in grades K-2. Results from this study could also assist responsible professionals such as architects, engineers, and school facilities consultants to plan facilities that will enhance the learning climate of a school.

Research Questions

The following questions were posed to help contain the study within a realistic framework:

1. What are the users' perceptions of the impact of their school's physical characteristics on learning climate?
2. What are the teachers' perceptions of the extent to which their school's physical characteristics meet stated criteria for an effective learning climate based on the following standards as identified by Castaldi (1977)?
    a. Illumination
    b. Noise
    c. Color
    d. Thermal Environment
    e. Space
    f. Location
    g. Maintenance
    h. Esthetics
    i. Safety
3. How do the reactions and behaviors of students and teachers compare and contrast in educational

settings that are located in two distinct regions of the United States?

Assumptions and Limitations

Assumptions

An assumption for this study was that all participants selected to respond to the instrumentation used did so in an objective and honest manner. It is also assumed that the design of this study provided an accurate description of the interface between school facilities and learning climate. Lastly, the review of literature reflected a need for more specific research relative to the interface between school facilities and learning climate.

Limitations

Three limitations of the study were:

1. Only three elementary schools in Northern Alabama containing grades K-2 were examined during this study.
2. Accurate data reflecting student perceptions were difficult to obtain from first and second grade students.
3. The presence of the researcher "on-site" possibly caused bias to occur in subject responses.
4. The comparative aspects of this study were generalizable to only school districts in two distinct regions of the United States of America.

Methodology

This study was guided by an extensive review of the literature. Two areas of inquiry served as the major foci of the literature review. These areas were learning climate and school facilities planning and construction. The design of this study was primarily based upon naturalistic inquiry techniques. Some descriptive techniques were also employed relative to the perceptions of teachers regarding the quality of physical characteristics of their schools. Several steps were implemented to insure the validity of results. First, the researcher became familiar with school district policies, procedures, rules, and regulations. Second, since extensive observations were employed, an introduction and orientation period was scheduled to allow all participants to become familiar with the researcher as well as objectives and techniques to be employed during the study. Third, in-depth survey techniques and on-site observations were performed. The observations were recorded in a systematized manner and instruments were used to assess the perceptions of teachers relative to the relationship of the facilities to learning climate.

The results of the assessment of teacher perceptions as well as the recorded observations were codified, categorized, and summarized. Findings, conclusions, and recommendations were developed based on the analysis and interpretation of all data. In addition to the above, the following sequence of steps were completed:

1. Specific criteria for final selection of facilities were developed.
2. Three elementary schools containing grades K-2 were identified, selected, and approved as facilities for this study.
3. Several on-site visits were made by the researcher to clarify procedures, respond to questions, and eliminate concerns and issues.
4. Unobtrusive and nonreactive observations were conducted.
5. Scripting and tape recorded notes were completed by the researcher.
6. Video tapes were used to record student and teacher behavior.
7. Two instruments were analyzed for use during the study. The first instrument was the Teacher's Education Facility Perception Questionnaire and the second was The Classroom Spatial Utilization and Migration Observation Form (Lowe, 1990).
8. Member checking techniques were used to validate all taped interviews.

Definition of Terms

The following are selected terms that are used repeatedly in this study and in the literature related to the interface between educational facilities and learning climate.

Auxiliary Spaces: Spaces that support the instructional program and accommodate the out-of-classroom needs of staff and students. Areas included in auxiliary spaces are auditoriums, food service and preparation areas, administrative areas, guidance and counseling offices, health service areas, and custodial/maintenance storage areas.

School Facility: The building and grounds that house and support the instructional program of a particular school campus.

Physical Characteristics: Aspects of the school facility that include age, interior and exterior design, square footage, maintainability, and location.

Age of Facility: Number of years or months since the initial construction date of the facility.

Age of Facility Modification: Number of years or months since a particular modification to the facility has been completed.

Facility Modification: Any alteration to the structure or design of the original facility.

Building Design: Exterior and interior structure and aesthetic appearance of the facility.

Location of Facility: Urban (downtown), suburban (inside city limits), and rural (outside city limits), locations of the schools.

Building Maintainability: Design features of a facility that serve to aid the cleaning and maintenance functions over a period of time.

Learning Climate: Learning climate may be described as variables found within educational environments that effectively or ineffectively accommodate positive teaching and learning. These variables may be physical as well as psychological and tend to be associated with the feelings and perceptions of all member stakeholders (Lowe, 1992).

School Community: Persons who are directly involved in the schools: (a) instructional staff, (b) support staff including principals and noncertified personnel, (c) students, and (d) parents and/or members of the community at large.

Spatial Requirements and Features: The necessary spaces designed especially to put the desired educational program into operation and the relationship of particular activity areas to other spaces inside and outside the building. Spatial features include utility accommodations, storage areas, and the furniture and equipment necessary to each learning space.

Users: Those who directly use the facility or those whose children use it; includes administrators, teachers, students, support staff personnel, parents, and representatives of the community at large.

Thick Description: A process used in qualitative research to narratively describe people, entities, or other things which are observed and carefully evaluated. The narrative report which results from observation during this process provide a factual account of the circumstance surrounding observations and evaluations, the characteristics of that which is studied, the nature of the environment in which observations occurred, and demographic elements which are related to the phenomena that is under study. This process also involves steps that require the researcher to provide interpretations of the meaning of demographic and descriptive data in terms of such matters as cultural norms, mores, community values, attitudes, motives, and behaviors. According to Lincoln and Guba (1985) and Owens (1991), this method of reporting "calls for synthesizing, integrating, and relating observations in such a way as to take the reader there" (p. 301).

Member Checks: The process of checking with other members of the organization being studied, to ascertain if information received is true. Owens (1991) wrote that this process involved steps by the researcher to corroborate data, information, and perceptions with subjects who are under study.

Triangulation: The investigator uses a number of sources of information and data, not necessarily about different things but also perhaps about the same things. For example, as themes begin to arise from interviews or documents or observation, they are cross-checked with other sources so as to verify them, to check the accuracy of information, and to test different actors' perceptions of given events. Whenever possible, the researcher should use multiple data-gathering techniques including interviews, document analysis, self-reports, questionnaires, observation, and other approaches. This ensures the potential for cross-checking and verifying data (Owens, 1991).

Organization of the Study

The organizational design of this record of study is as follows: Chapter I provides an introduction to illuminate the need for research on the subject, a statement of the problem, the purpose of the study, significance of the study, research questions, assumptions and limitations, methodology, the definition of terms, and organization of the study. Chapter II will present a review of the literature related to educational facilities and learning. Chapter III will be composed of two sections in which the design and methodology of the study are presented. Chapter IV will contain thick descriptive accounts of on-site observations recorded at each of the three elementary school

Referential materials: Wherever possible the investigator should create and maintain a file of materials from the site that relates to findings and interpretations. This can include all sorts of relevant documents (for example, handbooks, copies of memos, and other ephemeral materials). It might well also include video tapes, audio tapes, photographs, and films. These materials can help preserve over time some sense of the context in which observations were made and thus aid in the recall of events (Owens, 1991).

Unobtrusive Observation: Is the process of observing, recording, and analyzing human behavior or behavior patterns without the knowledge or awareness of those who are being observed.

Nonreactive: Occasionally, an inquirer does not want to engage in an interaction with his/her respondent, or there is reason to believe that his/her respondent would refuse to engage in an inquiry effort. In such cases, the inquirer should, if possible, move toward "measures" that produce the least possible reactivity. In many instances, these may be unobtrusive measures (Guba & Lincoln, 1981).

Scriptive Notes: Handwritten notes of an observation to an event. An example of events to be scripted could be the classroom teaching methods of a teacher or classroom interactions of students, etc.

facilities involved in the study and a statistical analysis of teacher perceptions regarding the quality of physical characteristics of their schools. Chapter V will provide the summary, findings, conclusions, and recommendations.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to present a review of the literature relating to the inquiry into the interface between school facilities and learning. In order to establish a theoretical and historical framework for the study, an historical perspective will be provided in the first section. The learning climate and elementary students will be reviewed in the second section. This will be followed by learning climate considerations in school planning and construction. Physical factors that impact learning climate will be the fourth section. The last section will be the relationship of learning to the physical facilities.

Historical Perspective

A brief review of the history of school buildings is quite revealing. During the Hellenistic Era (500 BC.-200 BC.), there were no school buildings as we know them today. Instruction was generally conducted in the open air, sometimes in the shadow of a temple, or in an enclosure that would barely protect the students from the elements. Education was primitive and uncomplicated in those days. Parents simply selected a teacher and sent only their boys to him. The meeting place of the students was incidental to the instructional process (Castaldi, 1977).

Colonial Period

Education in America began in the Colonial period. When the Puritans settled in the Massachusetts Bay Colony in the 1630s, they considered themselves to be creating a model religious commonwealth in the wilderness (Spring, 1990). Early Puritan leader John Winthrop told his fellow colonists in 1630, "We must consider that we shall be as a city upon a hill, the eyes of all people are upon us" (Cremin, 1970, p. 15). Their goal was to create the good society, which meant a well-ordered religious society that would win God's approval and be used as a model by the rest of the world (Spring, 1990).

To create a model religious commonwealth, education was considered essential to maintaining religious piety and social stability. The purpose in teaching reading and writing was to insure that not only individuals read the Bible and religious tracts but also that they become good workers and obey the laws of the community. These educational goals are explicitly given in the earliest colonial law regarding education, the Massachusetts Law of 1642 (Council of Educational Facility Planners, International, 1976; Cremin, 1970; Cubberley, 1922; Education Facilities Laboratories, 1960; and Spring, 1990). This law (1642) directed "the chosen men" (Selectmen, Councilmen) of each town to ascertain, from time-to-time, if the parents and masters were attending to their educational duties; if the children were being trained "in learning and labor and other employments--profitable to the commonwealth," and if the children were being taught "to read and understand the principles of religion and the capital laws of the country," and empowered them to impose fines on "those who refuse to render such accounts to them when required" (Cubberley, 1922, p. 195).

The religious theme received even greater emphasis five years later, according to Cubberley (1922, 1934) and Spring (1990) when the famous "Old Deluder Satan Law" was enacted in 1647 in Massachusetts. The law required communities to establish and support schools. Specifically, the law required any community having at least 50 households to appoint a teacher to provide instruction in reading and writing and any community of 100 or more households to establish a grammar school. Cubberley (1922) wrote that the preamble reflects concerns by stating:

> It being the chief project of old deluder Satan, to keep men from the knowledge of the Scriptures . . . that learning may not be buried in the grades of our fathers . . . the court orders . . . . (pp. 195-196)

It can be safely asserted, is the belief of Cubberley (1922) that in the light of later developments, the two laws of 1642 and 1647 represent the foundations upon which our American state public-school systems have been built.

The typical one-room schoolhouse of the colonial period was a small, crude shelter with wooden walls and roof with few windows. It was poorly heated (usually by a single wood burning stove) and was inadequately illuminated and ventilated. Sanitary facilities were all but nonexistent. The furnishings, consisting of backless wooden benches, were uncomfortable. By contemporary standards, the one-room schoolhouse was primitive and devoid of amenities. Only a victim of nostalgia could find it in any way appealing, either environmentally or educationally. Nevertheless, the one-room schoolhouse did serve the needs of an immigrant, agrarian society and its presence indicated an early recognition of the value of education--no matter how narrowly defined (Council of Educational Facility Planners, International, 1976).

Early American Schools

Thomas Jefferson, believing that the people are the safest depositories of government, thought free public education imperative for a strong democracy. His concept of allocating land in the Northwest Territory for public education purposes became the basis of the Land Ordinance of 1784, which the Confederation of States passed as the Northwest Ordinances of 1785 and 1787. These laws provided a legal framework for education that was adopted throughout the Northwest Territory (which would become the states of Ohio, Illinois, Indiana, Wisconsin, and Michigan) and later, by all the western states. Education provisions in the Northwest Ordinances allowed public lands to be leased to benefit local schools. To each state admitted after Ohio, the federal government allotted one section in every township of 36 sections for support of common schools and two townships of land for the endowment of a state university (Cubberley, 1934; Gulliford, 1984).

The early idea that the income from land grants, license fees, and permanent endowment funds would in time entirely support the necessary schools was gradually abandoned as it was seen how little in yearly income these funds and lands really produced, and how rapidly the population of the states was increasing (Cubberley, 1934). Cubberly continued by stating that by 1825 it was clearly recognized by thinking men that the only safe reliance of a system of state schools lay in the general and direct taxation of all property in order to support the schools. "The wealth of the State must educate the children of the State," (p. 371) became a watchword, and the battle for direct, local, county, and state taxation for education was clearly on by 1825.

With the advent of the 19th century, westward expansion, industrialization, and urbanization caused some changes. Population growth, particularly in the Eastern seaboard towns, necessitated a more efficient means of educating large groups of children. A system developed by a British schoolmaster, Joseph Lancaster, responded to this need. Implemented in the United States around 1806, the Lancasterian schools featured a large (50' x 100') room furnished with numerous rows of benches facing a teacher's platform (Council of Educational Facility Planners, International, 1976). The Educational Facilities Laboratories (1960) describes the Lancasterian school as follows:

> This system took the catechism as its model. Each subject was reduced to a set of questions and answers. The teacher drilled a group of 50 head pupils, or monitors, who in turn drilled 10 pupils. Thus one teacher was enabled to teach 500 students. Obviously, to work well this system required strict organization and a robot-like conformity. The management of the class, the classification of the students into rows by age and achievement, the details of recitation, and the use of apparatus were minutely prescribed. Deviation was outlawed. Discipline of an almost military character was rigidly enforced. This was an era still largely influenced by the puritanical views of Jonathan Edwards, who at an earlier data had warned "as innocent as children may seem to us, yet . . . . they are not so in the sight of God, and are infinitely more hateful than vipers." The Reverend George Whitfield, at about the same time, had pointed out the resemblance between children and rattlesnakes, "which," he said, "are likewise beautiful when small." (pp. 20-21)

The Lancasterian schools (which allowed only 10 square feet per pupil) spread quickly and disappeared almost as fast. By 1840 they had become a thing of the past. Until then, education had been a slow, expensive process because it had been carried out on an individual basis or in very small groups. By establishing the principle of group instruction at a low cost, and by orienting people toward the idea of education for the many rather than the few, Lancaster's schools paved the way for free, public, tax-supported schools as we know them today (Council of Educational Facility Planners International, 1976; Educational Facilities Laboratories, 1960). However, 17th- and 18th-century American school houses had progressed very little beyond the Greek nation in that they were shelters in which pupils and teachers came together. They did include some furniture--benches and tables for the pupils and a podium for the teacher. As late as 1844, American school buildings were still in a deplorable state (Castaldi, 1977). Knight (1951, cited by Castaldi, 1977) gave the following description of school buildings during this period in New York State:

> The great majority of the schools of New York State in 1844 were officially described as naked and deformed, in comfortless and dilapidated buildings with unhung doors, broken sashes, absent panes, stilted benches, yawning roofs, and muddy moldering floors . . . . Only one-third of the schoolhouses were reported in good repair, another third in comfortable circumstances, while more than 3300 were unfit for the reception of either man or beast. (p. 416)

After the Lancasterian system had disappeared, the free, graded school did not arrive overnight. It had to go through a step-by-step process of evolution. An important step was the unification of the separate reading and writing schools which functioned independently of each other though situated in the same building. After unification of these separate schools, the final step was sorting and grouping the children by age into seven, eight, or nine grades with a separate teacher for each grade and a system of promotion from one grade to the next with a corresponding progression of subject matter. This ultimate organizational step came about naturally, since for some time the course of instruction had been in the process of expansion, with such subjects as history, geography, grammar, composition, and even bookkeeping added to it. Moreover, textbooks were by now in common use, the school term had been lengthened, and the years of school had already been increased. The graded school was a child of the cities. Rural areas continued for many years to lump all their pupils together in one ungraded collection (Educational Facilities Laboratories, 1960).

The graded public schools called for a different architectural approach. An entirely new kind of schoolhouse architecture was worked out to meet the needs of the first fully graded, public school in the United States. This was the Quincy Grammar School built in Boston in 1848. It had four stories, with a basement and an attic. The entire fourth floor was an assembly hall large enough to seat the entire school population in pew-like benches. The remaining three floors were divided up into equal-size classrooms. Each classroom was 31 by 26 feet into which were crammed 56 pupils--less than 15 square feet per child. The classrooms featured a great innovation; they had, bolted to the floor, a separate desk and chair for each pupil--seven rows of them, eight to the row. These were a vast improvement over the benches which had been accepted for the one-room school in the early 19th century, and they were ideally suited to their function at that time. The pupil was to sit passively and listen to the instructor or watch him/her write at the blackboards which covered the better part of three sides of the room. Occasionally the students would rise to his/her feet and recite what they had heard or read. More important, with regard to symbols of authority, a separate office for the principal was included in the Quincy design. The Quincy school became the standard for urban elementary schools throughout the country, lasting well into the 20th century (Cubberley, 1934; Education Facilities Laboratories, 1960; Spring, 1990).

Schools from 1850 to the Present

The first public kindergarten in the United States was opened in St. Louis in 1873. It was alien to the existing school system. Its emphasis was on the individuality of the child, on the unfolding of one's unique personality, and on one's ability to function effectively as a social creature in relation to other children. It encouraged children to build, work, and play together. Music, art, dancing, and other forms of creative expression were used to release native talents and energies. The trend was irreversible. Rooms became larger. Furniture had to be unbolted from the floor. Open shelves and new storage space for paste pots, scissors, clay, paint, and building materials had to be supplied. Some rooms had sinks installed in them so a ready water supply would be available for science experiments and art work (Cubberley, 1922; Educational Facilities Laboratories, 1960; Spring, 1990).

Another innovation, which came to American schools from Finland and Sweden via the Philadelphia Centennial Exposition of 1876, was manual training. Metalwork and woodwork objects, turned out by foreign students and displayed at the Exposition, were highly praised by the President of the Massachusetts Institute of Technology. In 1989 the first manual school was opened in St. Louis, and eventually manual training courses were incorporated into the curriculum of the upper elementary grades. For girls it was in the form of needlework, weaving, and the home arts; for boys it was wood and metal work. The manual school later developed into the vocational school. However, the original idea of manual training was not to teach a trade but to provide the student with manual activities that would complement a liberal education. At the turn of the century the total space per pupil ranged from 40 to 80 square feet. By 1940, the range was 80 to 100 square feet per pupil, and in the postwar period the range was 80 to 130 square feet. Today the average of 160 to 180 square feet per pupil is common (Educational Facilities Laboratories, 1960; Spring, 1990).

Meanwhile, in the secondary school, even more revolutionary changes were going on. Its status as a legal part of the tax-supported, public school system had been established by the Kalamazoo Decision back in 1874. The high school had become an extension of the elementary school, providing a ladder on which all children could move from ABC's at the bottom, all the way up to a high school diploma. In 1910 the junior high school appeared on the scene to help children make the transition from the less formal atmosphere of the elementary school to the more formal environment of the high school (Kowalski, 1989; Spring, 1990).

The turn of the century brought with it the beginnings of a reaction against regimented instruction. From about 1890 to the 1920's the size of the class was reduced from 56 children to about 30. The change was influenced by a number of factors--the falling birth rate, the slowdown in population growth, and the rise in church-related school enrollments. But, basically it sprang from public acceptance of changed educational outlooks that had come from new knowledge of child growth and recognition of individual differences. The ideas spread by Pestalozzi, John Dewey, and William James had stimulated a freer approach to education, entirely redirecting the elementary schooling of children. John Dewey became the forerunner of these new ideas called "progressive education" (Cubberley, 1934; Educational Facilities Laboratories, 1960; Otto, 1934; Rugg & Shumaker, 1928).

Rugg and Shumaker (1928) wrote that one day in 1896 a young man methodically made the rounds of Chicago's school supply stores. He and his neighbors were starting a new school for their children. Patiently he described his wants: "desk and chairs thoroughly suited from all points of view--artistic, hygienic, and educational--to the needs of little children." An afternoon of uncomprehending argument with salesmen whose vocabulary and understanding were as standardized as the furniture which they sold ensued. And then the dealer, with more discernment than salesmanship said, "I am afraid we have not what you want. You want something at which the children may work; these are all for listening." "And that," says John Dewey, "tells the story of the traditional education" (p. 1).

Observation and investigation now took the place of memorization. Discussion, evaluation, and self-expression superceded the mere regurgitation of facts. This opened the doors to new subject matter: elementary science, home geography, language usage, and new study of numbers and primary arithmetic (Educational Facilities Laboratories, 1960; Spring, 1990).

Two new subject areas were added to the schools; instrumental music and physical education. Vocal music had been recognized in the early 19th century. It was during the First World War that music really found a place for itself in the schools. Fundamental importance was given to music in winning the war. The value of music was brought home to the people. The nation became a singing nation with bands playing national songs. Schools now offered band music. In 1917 so many men had been turned down for physical unfitness that physical education was instituted in schools. During the 1930s the physical education program came under attack as an educational frill; however, World War II proved the need for better physical conditioning when a larger number of men were turned down than had been selected for World War I. As a result, today's schools have gyms, locker rooms, showers, and space allotments for physical education that is now taken for granted (Educational Facilities Laboratories, 1960).

Between 1914 and 1958, within the context of national economic and industrial expansion, schools grew in number, size, and variety of program offerings. Between 1933 and 1937 the federal government, specifically the Public Works Administration, became involved in financing school construction. State-controlled building standards were instituted during the 1940s. During the 1950s (an important period in school construction) school construction was a multi-billion dollar effort and school design reflected an interest in accommodating more movement, activity, and experiential learning. Box-like structures gave way to clusters, finger, and campus plans. New materials--glass, concrete and steel--appropriate furnishings, and recreational and athletic facilities became standard school features (Council of Educational Facility Planners International, 1976).

Since 1960, schools have been affected by generalized social ferment and accelerating rates of change. Diversity of design is obvious. Flexibility, new building systems, open space, complex equipment, carpeting, air conditioning, moveable walls, pods, and new energy sources are a few features of contemporary schools. These innovations are the result not only of new technical capabilities, but also of a rather pervasive change in the perception of how learning happens. Contemporary educational planners are coping with a complexity of new issues and needs: declining enrollments, and disposing of unnecessary buildings, intelligently using energy and other environmental resources, providing for more creative forms of career education, extending the use of schools as a community resource, modernizing and recycling existing facilities, designing to avoid vandalism, providing flexibility which will allow response to future unknown needs, designing for the handicapped, and so on. The relatively unexplored field of environmental psychology and its implications for educational facilities (i.e., how certain spaces affect their inhabitants, how the school affects the learner) have not yet been fully disclosed. Related to this development is the ever present concern: how to humanize the environment (Council of Educational Facility Planners, International, 1976; Kowalski, 1989; Spring, 1990).

The Learning Climate and Elementary Students

It is generally agreed among educational psychologists that the feelings of belongingness and of security are of paramount importance in the learning process. The rejected child and the insecure student, for example, have certain psychological needs that must be satisfied before learning can take place effectively (Castaldi, 1977). Ruch (1958) stated:

> Man everywhere seems to have certain basic psychological needs which he expresses through the social patterns of his particular culture. Among these are the need for security, the need to respond to others through the exchange of love and esteem, the need for new experience and greater knowledge, and the need for approval and some degree of prestige. (p. 138)

In this same connection, Jersild (1950) also believed that belongingness is an important aspect of the well-being of a child. He wrote: "In time, through a combination of many factors, one of the strongest motives of a child's life is the desire to be accepted, to belong . . ." (p. 185).

The school is for learning--not just for teaching. And the physical environment is a powerful force in this learning process (Gardner, 1968). The American Association of School Administrators (1960) wrote:

> The school climate influences teaching and learning. It envelops the child from the time they enter school in the morning until they leave at the end of the day. It is an encompassing atmosphere. Its quality is determined by each individual's sensitivity to the

> mellowness or harshness, the pleasantness or unpleasantness of their physical surroundings and by their relationships with classmates, teachers, and principal. The child is a part of their environment and cannot readily or easily separate themselves from it. They take it as it is--they see it, feel it, absorb it--and scarcely are conscious of it. If it is too hot or cold, too noisy or too dark, too bright or too crowded, they are restless, uneasy, frustrated, and disturbed. Their learning is impeded and their mental growth is retarded. But if environmental (climate) conditions are stimulating and satisfying, if they are at ease and comfortable, and have the tools they need for their work, learning will be natural as the growth of a vigorous and healthy plant. The beauty, order, warmth, and cheerfulness of the environment become a part of their attitude, a part of their behavior--become a part of them. (p. 23)

School Building--A More Effective Tool

There are several areas in which Castaldi (1977) believed the school building can become a more effective tool for the learning climate of students. Six of these areas have been selected (pertaining to elementary students) and presented as follows:

1. School Facilities for Multi-stimuli Instruction.

School buildings can become more effective tools of education if they expose the pupil to learning experiences that embody several types of stimuli. School facilities might be devised so that students receive the initial learning stimulus through one sense and a second stimulus later through another. For example, an illustrated presentation by the teacher could be followed by a second presentation, one involving the sense of touch and smell, which could be conducted in a specially designed laboratory space. It might also be possible to plan instructional spaces so that learning could be improved by appropriate lighting effects--spot lighting, color, and changes in light intensity--and by the ingenious use of sound effects.

2. School Facilities for Attending and Learning.

Since the attention span of individuals is relatively short, variety in the learning situation can improve the quality of the learning. Teaching space might be deliberately designed to permit teachers to shift easily and quickly from one type of activity to another. The ease with which such changes can be made encourages the teacher to limit the duration of classroom activities to periods that are well within the attention span of the pupils.

The attention of pupils is improved when the character of the activity alternates between mental and physical efforts. It might be advantageous, therefore, to design elementary schools with direct access to a well-developed outdoor instructional area. The teacher could then alternate between physical and mental activity at will during favorable weather.

3. School Facilities that Nurture Readiness.

Readiness for learning can be accelerated by providing for suitable pupil activities in a school building. Since the state of readiness for learning varies among pupils, there might be a substantial advantage in designing a school building for nongraded classes. It might be advisable to include flexible spaces that can be subdivided into smaller spaces in which pupils may begin new learning experiences as soon as they are ready for them. The pneumatic partition is admirably suited for this purpose. Newly formed spaces could be used by small groups of pupils who become ready for experiences in independent project work, music appreciation, and independent reading. This flexibility also enables the teacher to match the learning experiences of the pupil to his/her readiness for such experiences.

4. School Facilities That Promote Motivation.

School facilities can be designed to promote the growth and development of both extrinsic and intrinsic motivation. Extrinsic motivation can be stimulated by providing situations in which the pupil enjoys a feeling of accomplishment, recognition, or approval. In this connection, there might be some merit in placing three-dimensional displays along the corridors where the work of pupils may be exhibited. An "honor bulletin board" could be installed in the main lobby for display of notices, articles, and materials that reflect pupil achievement.

Intrinsic motivation can also be significantly influenced by the design of a school building. Instructional spaces could be designed to facilitate the construction of specially prepared teaching materials, and the use of electronic instructional devices and audiovisual equipment. The specific means of stimulating intrinsic motivation are limited only by the ingenuity of the school planners and by the creativity of the teacher after the spaces are completed.

5. School Facilities That Reduce Fatigue and Improve Learning.

Every design feature of a school building that lessens fatigue may help improve learning. Any increase in the comfort and convenience of teachers and pupils tends to reduce fatigue. School planners should design schools with suitably controlled thermal environments, quiet and well regulated ventilating systems, good visual environments with appropriate brightness balances and high-quality illumination, and attractively decorated interiors. Schools should be free from "cross-talk" (through ventilating systems), fan noises, and distracting sounds and vibrations.

Psychological fatigue results from boredom and monotony, both of which can be diminished in instructional spaces that are uniquely designed to stimulate pupil interest in the subjects being taught in these rooms. Attention might be concentrated on shape, color, flexibility of teaching activity, and essential instructional materials.

6. School Facilities for Incidental Learning.

Incidental learning represents an educational bonus in any school. The ingenious design of a school building can stimulate "unconscious" learning immeasurably. For example, in designing a school, scientific instruments could be stored so that they can be viewed from the corridor. A brief description of the equipment placed beside the instrument would allow students to learn about Geiger Counters, Dphygmomanometers, Telsa Coils, Van de Graff machines, etc. In this way individuals can learn without realizing that learning is taking place (Castaldi, 1977).

The Aesthetic Environment and Student Learning

The relationship of an aesthetic environment and student learning can be analyzed in two effects, namely direct and indirect. In the direct aspect, the relationship of an aesthetic environment and student learning has a significant correlation. Better student learning is achieved as a result of an improved aesthetic environment (Chan, 1988). First, according to Reeves (1985), "the building teaches. The student in good surroundings sees, feels, and appreciates the values that are there. The building teaches by the state of the art that is displayed in its construction, systems, and function" (p. 41).

Second, an aesthetic environment is conducive to student learning. In previous studies, student achievements were compared in school buildings of different qualities based on the aesthetic factors of lighting, coloring, and carpeting. Results of these studies have indicated significant enhancement of student achievement in quality school buildings of higher aesthetic standards. Chan feels there is no doubt that new school buildings, with the use of modern fluorescent lighting, possess an aesthetic outlook more appealing to student learning than older school facilities with inferior settings (Chan, 1988).

Physical Environment and Learning--A Case Study

Bowers and Burkett (1988) conducted a study to determine if students' learning could be directly related to the physical environment of their respective facilities (schools). Two schools were selected for the study. The newest elementary school in a selected rural Tennessee county school system presently houses 758 students, and was occupied during the 1983-1984 school year. It is located on ten acres and contains thirty-three classrooms with a student capacity of 825 students. There are three administrative offices, a conference room, teachers' workroom, twenty-four restrooms, a gymnasium, cafeteria, music room and a well-equipped shop. The structure consists of concrete block and brick. Fluorescent lighting, electric heat and air conditioning were incorporated. The acoustics, color schemes, and furniture blend into the physical environment.

The oldest school in the same school system houses 584 students. It was completed in 1939. An addition was added in 1950. Thirty-three acres serve as a campus for the school which contains two administrative offices, twenty-six classrooms, six portable classrooms, one classroom in the shop building, eight restrooms, a library, cafeteria, gymnasium, and auditorium. The student capacity for the main building is 650. Fluorescent lighting, a coal-fired furnace, and several unit air conditioners were in the structure which was built of concrete, plaster, and brick. No conscious effort was made to control the acoustics, coordinate colors, and replace outdated furniture. Both elementary schools serve grades kindergarten through eighth grade (Bowers & Burkett, 1988).

During the 1986-1987 school year, 280 fourth and sixth grade students, housed in the two separate facilities, were tested to determine the degree of academic achievement. Records were also kept of occurrences of illness, attendance, and misbehavior. These students were assumed to be from somewhat similar socio-economic levels. Principals and teachers at the schools were considered to be on a par with each other due to certification levels, age, and experience.

Students in the modern building scored significantly higher in reading, listening, language, and arithmetic than did students in the older building. Students in the building (modern) with a more desirable physical environment were disciplined significantly less frequently than students in the building with a less desirable physical environment. Students in the school building with a more desirable physical environment had significantly higher attendance records than did students from the school with a less desirable physical environment. The county school system nurse reported to the researchers that records showed that one fourth grade student in the modern building contracted pneumonia during the 1986-1987 school year. Three sixth graders were stricken with strep infections. Fourth graders at the older school contracted strep infection four times, eye infections two times, and chicken pox two times. One ear infection, six strep infections, and one heart condition plagued the sixth graders (Bowers & Burkett, 1988).

Analyzed data revealed that in every case a significant difference existed between students at the two elementary schools in regard to the relationship of the physical environment and student achievement. Scores in reading, listening, language, and arithmetic showed a significant difference, with the modern building students performing much better than the older school students in every case. Students in schools where special attention has been given to the physical environment experienced a greater degree of success in the academic realm of the curriculum as well as attendance, discipline, and health (Bowers & Burkett, 1988).

Physical Setting of the Classroom to Learning

The physical setting of the classroom is an integral element of the learning environment (climate). Although it does not "teach," the classroom setting facilitates certain behaviors and hinders others. These influences on behavior may be both direct and symbolic (Proshansky & Wolfe, 1974). For example, if students seated in straight rows are unable to carry on a discussion due to difficulty in hearing one another, this would be a direct effect of the environment. On a more symbolic level, they may infer from the seating arrangement that the teacher does not really value class participation and that they are not meant to interact to any great extent (Weinstein, 1981).

Several studies, according to Weinstein (1981), indicate that when given the opportunity and some encouragement, students have innumerable ideas about what constitutes a good school climate. Elementary children from different school settings voice the same spatial concerns, for example: a stimulating environment, adequate personal space, a comfortable room scale, "a place of my own where I can keep my things," private places, and the opportunity to help decide on room arrangements (p. 18). Listen to Arthur, a student, speaking of his ideal classroom (Coles, 1969):

> I'd like comfortable chairs like ones that had cushions so your back doesn't hurt and your bottom either. I'd like us sitting around--you know, looking at each other, not in a line, not lined up. I'd like a sink, where you could get some water to drink, and you wouldn't have to ask the teacher to go down the hall . . . . There'd be a table and it would be a lot nicer room than it is now. We could have our books in bookcases, and we wouldn't have to sit in the same place all the time . . . . I'd like to be able to take my shoes off and relax. The floor is so cold, you can't do that now--most of all, really most of all [a window in the roof so you could] just look up and see the sky and the clouds and the sun and when the rain falls you could see it falling and you'd like it better being in school. (pp. 49-51)

Learning Climate Considerations in School Planning, and Construction

Impact on the User

For every young child, the school building may be one's first experience with the outside world--one's first contact with the beautiful--fine architecture, integrated with art and sculpture. Here, as in all good architecture, scale is of special importance; one must always remember the user. Beauty in all its aspects is a necessary quality of any school building. For every child, the school should feel like one's own very special place. Children should be able to find there a learning climate that brings opportunity, self-confidence, and the vision of a bright future. Their station in life a few years hence may well depend upon their experiences in the elementary and secondary school. Unfortunately, the American scene today, for many children, is bleak. The slums, the monotony of typical subdivisions, the ugly, crowded streets, the conglomerations of signs shouting for attention, the poorly designed buildings, and the careless mutilation of nature are all too evident. These and many other factors make it mandatory that the school for these youngsters become an oasis of all that is fine and good. This may be the only opportunity for many to experience, at a formative age, qualities of aesthetics vital and necessary to the education of every student. If the school fails them at any point--whether it be in stimulating and directing their active minds and bodies, introducing them to a sense of harmony and order in the world about them and in the whole universe, or instilling in them a sense of satisfaction and a feeling of accomplishment through learning--their future has been impaired (American Association of School Administrators, 1967).

It seems foolhardy to expect the child to appreciate art, history, civic pride, the beauty of the spoken and written word, and the order and discipline of the sciences and mathematics--in fact, the intricacies and wonderfulness of the entire educational process--in an environment that is drab and void of inspiration. It is the responsibility of school administrators to provide children with the proper environment for learning. Children need beauty in their lives, and the school building should make a major contribution toward fulfilling this need (American Association of School Administrators, 1967; Kelley, 1980).

Spaces Within an Elementary School

Spaces in an elementary school can be divided into three categories. The first includes standard classrooms (kindergarten through upper grade levels). The second is special instruction areas such as art, music, physical education, and the media center. The last category is made up of those spaces providing general support services for the school (e.g., administration, cafeteria). The descriptions of these areas presented are not intended to be exhaustive. They do, nevertheless, profile the range of rooms that should be found in an elementary school that is committed to good learning climate considerations and constructed with the end in mind.

Before examining each of these three categories, it is helpful to review certain considerations that apply to all instructional spaces in a modern school. The more cogent ones are listed here:

- All instructional areas require adequate electrical outlets. Many older schools were not designed to accommodate the use of audio-visual equipment and computers. Although the quantity of outlets needed will vary depending upon function, at least two double outlets on each wall are recommended.

- The use of interactive television is a growing practice in organized education. New facilities should have coaxial cable and fiber optics installed in original construction. If this is not possible, at the very least, the conduit required for subsequent installation should be included in the original design.

- All instructional areas require light control. This includes control of natural and artificial light.

- Air conditioning is highly recommended for most climates. Increasingly for good learning climate and teachers' request, windows with screens should be installed that can be opened for a natural flow of air for ventilation at times when mechanical cooling is not needed.

- Storage is usually a problem for most teachers, administrators, and students. Modern schools should provide ample storage to accommodate the increasing amount of equipment and materials used in the instructional and extracurricular programs.

- It is common practice to keep classrooms housing the same grade level clustered. Thus, all first-grade rooms should be located in the same area of the facility unless there exist compelling reasons to do otherwise. Likewise, primary grades are typically kept in one part of the building while intermediate grades are in another.

- Every school should have some flexibility of space to accommodate large group instruction. (Kowalski, 1989)

Standard Classrooms

Kindergarten classrooms should be different from standard classrooms. They ought to be larger and provide flexible space. Separate student restrooms are highly advisable in kindergartens (i.e. separate restrooms designed within the classroom which are accessed without leaving the classroom). A carpeted area adds to the warmth of the room and permits students to sit on the floor for certain activities. Most kindergarten rooms have a special area permitting the teacher to read to all the students at the same time (i.e., either a story pit or risers in one of the corners). A sink and counter space are commonly included and provisions for students' coats, boots, and the like should be provided directly in the classroom environment. Kindergarten rooms are generally designed to accommodate 18 to 25 students at a given time. Accordingly, a room of approximately 1,100 to 1,300 square feet is needed. Increasingly, kindergarten programs are infusing readiness activities, such as penmanship, into the curriculum. A chalkboard, at least half should be permanently lined, is a common feature. Expandability of a kindergarten should be considered in the original design. That is, additional kindergartens can be built as part of an addition so that they will be next to the existing kindergarten rooms. Easy access to transportation areas and the playgrounds is also a prime consideration with regard to location within the facility (Kowalski, 1989).

Regular classrooms are used for grades above kindergarten. In the primary grades (1 and 2) special attention should be given to include some permanently lined chalkboards and placement of chalkboards and counter space at appropriate heights. In the primary grades, separate restrooms should be provided inside the classrooms, especially for the first grade. Coat storage should also be provided inside the classroom. Regular classrooms in an elementary school are usually designed to accommodate 25 students and should be 1,000 square feet (Castaldi, 1977; Kowalski, 1989).

Special Instructional Spaces

Two frequently identified special instructional spaces in an elementary school are art and music rooms. Not all schools that use special teachers in these areas have special rooms. Where these rooms are lacking, the teacher simply moves from classroom to classroom to provide instruction. It is far more desirable to have rooms designed especially for art and music for at least two reasons: (1) the teacher does not have to limit instructional activities based upon equipment that can be moved from classroom to classroom, and (2) the additional rooms tend to reduce overall utilization levels within the school, providing greater programming flexibility. Also, separate art and music rooms provide a transitional experience for young children that prepares them to eventually encounter departmentalized instruction (Kowalski, 1989).

An art room in an elementary school functions best with ample storage. The room ought to be located so as to provide relatively easy access for all children in the building. Access for the youngest children is especially important. Carpeting is usually avoided in this room and the inclusion of a kiln is becoming quite common. Art rooms should have at least two sinks. One accommodates the need of children to wash their hands and the other accommodates the cleaning of equipment and materials. Artificial and natural lighting are also important considerations. Art rooms generally are between 1,000 and 1,500 square feet (depending on whether an office and/or a separate storage room is included). Art rooms should be designed to provide direct access between the room and the outdoors. This design feature facilitates outdoor drawing and other activities that may be part of the curriculum (American Association of School Administrators, 1967; Kowalski, 1989).

When both general and instrumental music are taught in the same room, it is not uncommon to incorporate several small practice rooms into the music complex. Some instructors prefer to have risers in the room while others do not. If flexibility is a high priority, portable risers may be advised (as opposed to the fixed type). The music room should be located away from the low noise areas in the school, yet should not be isolated to the extent that the smaller children will have difficulty finding it. Often music rooms are located next to the facility having a stage (e.g., the gym, an auditorium) to accommodate special shows. Elementary school music rooms vary in size from about 900 to 1,500 square feet depending upon the features provided (Kowalski, 1989).

A third specialized instructional space that is becoming common in elementary schools is the computer laboratory. This area ought to be designed to accommodate an entire class at one given time. Thus, a laboratory usually includes about 26 stations. Writing boards made for felt-tipped pens are often preferred to chalkboards in these rooms because they do not generate chalk dust. A central location in the building is usually preferred; perhaps the most common placement of the computer laboratory is next to the media center. A computer laboratory is generally about 900 to 1,100 square feet. Other special areas include the speech and hearing clinic and special education classrooms. Rooms used to house self-contained special education programs such as those for the learning disabled or the mentally handicapped are generally about 900 square feet. Classrooms housing programs for more severe disabilities ought to have a self-contained restroom(s). If special education classes function in a resource room, they are generally about half the size of a regular classroom. Speech and hearing clinics range from about 150 to 300 square feet, as anywhere from one to seven students may be receiving therapy at any given time (Castaldi, 1977; Kowalski, 1989).

By far the most common instructional support space in an elementary school is the library or media center, (used interchangeably). The elementary school media centers vary markedly in size and design; however, the following spaces are common:

- An office for library/media personnel (especially for the director)
- A workroom for repairs, cataloguing, and so forth
- A storage room for audio-visual and other materials
- A main reading room (library)
- A storytelling area in the main reading room

A media center should be a focal point within a school. It should be a warm and inviting area--clearly transmitting the message that learning is both pleasurable and important. A central location is generally recommended unless instructional strategies suggest an alternative. One consideration that deserves special attention is whether the media center should be designed as an "open" or "closed" space. An open media center should be designed so that access is gained without going through doors--meaning that there are virtually no walls. The advantage of this approach is that it gives an inviting appearance to the area. The disadvantage is that it presents security problems. Both open and closed designs are widely used in elementary schools, and principals and librarians usually have strong preference as to which option should be used in their school. Media centers vary markedly in size in an elementary school. Some may be as large as 2,500 square feet. As a standard rule, it is recommended that a minimum of 10 percent of the school's enrollment be able to sit in the library at any given time (Kowalski, 1989).

One option for meeting the space needs of instructional aides is the creation of an instructional support complex. This space, usually adjoining the media center, provides offices and instructional rooms where teachers and aides can work with children individually or in small groups. This concept is especially popular in schools where teachers prefer that the aides work with children outside of the regular classroom climate. If such a complex is included in the design, it should provide flexible spaces to meet a variety of special needs (American Association of School Administrators, 1967; Kowalski, 1989).

For a good learning climate, an elementary school should have a gymnasium. This area serves at least two major functions: (1) space for instruction in physical education and (2) a space for recreation (indoor recess or intramural sports). The size of the elementary gymnasium should be 1 full-time unit per 15 teachers, 2,400-2,800 square feet. If the budget will not permit construction of an auditorium, a stage, 600-800 square feet (in addition to the above mentioned square footage) should be placed in the gymnasium so that special programs can occur there. If a permanent stage cannot be included, a portable stage is recommended. The location of the gymnasium should take into consideration access to the outdoors, isolation from the low noise areas of the facility, and the security zoning if the facility is to be used during evenings and/or weekends (Castaldi, 1977; Council of Educational Facility Planners, International, 1976; Kowalski, 1989).

General Support Area

The cafeteria is one of the more obvious general support areas in a school. To enhance the learning climate, separate dining facilities for elementary children should be required. Increasingly, new schools include a dining room for adults. This permits teachers and staff to be away from the children for at least a small part of the day. There is a vast difference in height and weight of a kindergarten student and a sixth grader. Therefore, it is recommended that consideration be given to planning seating arrangements that are scaled to the size of the individual. If at all possible, K-2 should be seated in a separate area, 3-4 and

5-6 grades in their own areas, with chairs and tables sized to their needs. The cafeteria should be located away from low noise areas and provide relatively easy access to the outdoors since children often go directly to the playground after lunch (Council of Educational Facility Planners, International, 1976; Kowalski, 1989).

Many older schools were designed without areas specifically designated for teacher workrooms and lounges. In today's elementary school, a workroom and teacher lounge should be considered a necessity rather than a luxury. To produce a better learning climate, faculty members need an area where they can prepare materials and lessons and have access to support literature (books, journals, etc.). In many schools, a single room is designated as a workroom/lounge. Where possible, this concept should be avoided. The workroom should be an environment which is quiet and the lounge should be a place for casual conversation and relaxation.

The administrative complex is another visible support area. This typically includes the principals' office, a reception area, a workroom, adult restrooms, a conference room, a book/storage area, a guidance office, and a health suite. The health suite houses the school nurse and provides space for children who become ill at school. A restroom(s) is required in this area. At least two privacy areas for sick students should be included. The administrative complex should also provide space for record-keeping (files and other materials), and a fireproof safe is highly desirable. The administrative complex should be located near the main entrance to the school (American Association of School Administrators, 1960; Castaldi, 1977; Council of Educational Facility Planners, International, 1976; Kowalski, 1989).

Restrooms should be properly dispersed throughout the school. Typically, student restrooms are designed to permit the primary grades to use one set and the intermediate grades to use another. This allows the fixtures to accommodate the physical size of the children. Adult restrooms are also necessary so that faculty, staff, and visitors are not forced to use student restrooms (Kowalski, 1989). The number of facilities required for students in an elementary school may be determined using the following formula developed by Hawkins and Lilley (1986);

> Lavatories:
> 1 for every 30 students if total enrollment is below 300
> 1 for every 40 students if total enrollment is above 300
>
> Water closets:
> 1 for every 40 boys plus 1 urinal for every 30 boys
> 1 for every 35 girls. (p. 58)

Other areas that should be considered for an elementary school include a custodial office/workshop, 500-550 square feet; general storage, 300-500 square feet; and articulation spaces (hallways) (Castaldi, 1977).

Play and Learning

Theorists and researchers who have analyzed childhood development, such as Friedrich Froebel, John Dewey, Rudolph Steiner, Maria Montessori, Jean Piaget, and Susan Isaacs, agree on several principles of child development, including the importance of play. No environment for children--including a play space--should be designed without these principles in mind (Eriksen, 1985).

Eriksen (1985) continued by pointing out that these theorists and researchers agree that healthy growth and development--including physical, emotional, social, and intellectual growth--is based on stimulating learning experiences that arouse the learner's interest. These principles are based on a belief in the natural curiosity of children and their innate desire and ability to learn. Play is certainly an area of activity in which children's natural curiosity usually guides what they learn. They will want to know many things--what is it? Why? How? Can I do it?--as they explore a nature area, walk through a maze, or experiment with a rope ladder. Play should be controlled by the children's own interest. They pursue whatever arouses their curiosity as they are attracted by this object or diverted by that object.

Safety is an important consideration in planning any area, but it is especially important in thinking about outside areas. Unnecessary hazards must be eliminated and the greatest hazard comes from traffic on the street. For safety a child-proof fence with adequate fastenings on the gate is essential (Baker, 1968).

A separate playground area for K-2 should provide at least one hundred square feet per child. It should provide at least one small hill for rolling, sliding, and crawling. Some trees for climbing and some shrubbery for aesthetics and study are advisable. There should be areas for experience with texture and for different kinds of exploration: sand, grass, dirt, and hard top. In addition, the following may be provided:

- Fenced area for animals
- Stream or wading pool
- Nature area for planting
- Climbing apparatus
- Boards and large blocks
- Tent
- Wheel toys
- Tunnels (i.e. concrete culverts)
- Bridges
- Hill slide.

(American Association of School Administrators, 1967; Kritchevsky, Prescott, & Walling, 1977)

Conclusion

For a good learning climate children need activity. They need to move around for kinesthetic reinforcement of learning. They need to participate vigorously with their bodies and emotions as well as with their intellects. They need to help create and continuously to reshape the learning environment (climate). The school that meets these basic needs of children is helping to produce people who will be able to take initiative. In such schools self-confidence is cultivated; habits of independent action are formed; ability to collect data and to see relationships is strengthened; and satisfactions that come from facing new challenges, mastering difficulties, and being actively creative in many ways, are tested (American Association of School Administrators, 1960).

Physical Factors That Impact Learning Climate

Birch and Johnstone (1975) wrote that we are in the midst of an extremely important shift in emphasis on the perception and consideration of the critical relationship between a building and its surroundings and the people who use it or are affected by it. The hardest new lesson is the recognition that a facility used by a live organization is never finished. It is never finished. It is, on the contrary, always in a state of adjustment, growth, and restatement. This is what the living process is all about. "We didn't know the future was coming," is the excuse of fools (p. 46).

Birch and Johnstone (1975) stated their concerns for the learning environment, or climate, are as follows:

> We are concerned about the manner in which children learn and the impact of their physical environment on the effectiveness of the learning experience, we are concerned because we create that environment. We know that a child's education is made up of everything that happens to them [sic], good and bad, at home and at school. The shaping of the learning environment must hinge on what we intend the child to do, because he learns from what he does and only from what he does. Much happens accidentally without forethought or planning. The child can learn sitting under the blue

> sky in an open field. That is, he can learn effectively if he is comfortable. since we cannot control the weather, we protect him from it by enclosing space. We cannot afford a teacher for every child, so we gather them together in a teaching-learning place. We try to make it a comfortable place, a friendly place, a child's place, where he can feel secure and safe, free of tensions that may affect his learning.
>
> The environment within which the child is growing physically, intellectually, and emotionally is an environment that we, the administrator, the teacher, and the architect create: the great teaching machine that we call a school building. (p. 46)

Some of the most important physical factors that impact learning climate are illumination, noise, color, space (which has already been discussed) and thermal environment (temperature, humidity, and ventilation).

Illumination

Light and the visual environment, those properties affecting our sight, automatically fall into two categories, natural and artificial. Most classrooms have a combination of both, and the teacher can knowingly emphasize a chosen class climate by the manipulation of these components. Consider, for instance, the effectiveness of soft, natural light for leisure reading or for quiet individual study, or for a planned mood change following a period of high, active productivity. Varying the quality and quantity of light occasionally during the day serves as a physical aid to the eyes; somehow this seemingly small change can be both physiologically and psychologically beneficial (Hanlon, 1979).

Every object reflects some portion of the light it receives. The percentage reflected is known as reflectance. Reflectance of surfaces in the school environment is a significant factor in the design of a successful lighting system. Color and texture of materials affect their reflectance. Light colors and glossy finishes have a higher reflectance than do dark colors and rough finishes. Therefore, in order to achieve brightness balance and the type of hemispherical illumination which has been found to be most suitable for reading and writing, careful attention should be paid to the colors and textures of walls, floors, and furniture (Clute, 1937; Council of Educational Facility Planners, International, 1976).

Hathaway (1987) wrote that for people who are outdoors for a significant part of each day, the quality of indoor lighting to which they are exposed may be of little consequence. Their needs for natural light stimulation may be adequately met. But for people who spend almost all of their time indoors, and with outdoor exposure limited to morning and evening light, there may be a need for artificial lighting that is supplemented with light stimulation in the spectrum areas of energy deficiency--especially ultraviolet. Moreover, a visual environment rich in blues, greens, and the earth tones of nature may be needed for relaxation and for the reduction of stress.

Hathaway (1987) continued by stating that using windows to obtain the required ultraviolet light supplements is of little effect because ultraviolet light, the most significant missing component in artificial light, is effectively filtered out by ordinary window glass.

Paralleled banks of fluorescent lamps are recommended for artificial lighting. As a cost-saving measure and as a dispenser of a more even light, fluorescent banks have the edge over the incandescent type. The lighting banks should run parallel to the screen and chalkboard area. With the lighting situated in this manner, possible glare on the screen and chalkboard can be lessened by turning off the bank of lights closest to the screen and chalkboard. Control of the lighting is essential and can be accomplished in several ways. Each bank of lights should have a separate on-off switch. Dimmer switches are essential to allow for teacher-controlled levels for viewing or reading and writing. Switches should be located within immediate proximity of the teacher as well as at the door's edge (Ordway, 1981).

Noise

Keeping noisy areas separated from quiet ones and keeping students quiet can no longer stand alone as the solutions to controlling noise in school buildings (Glass, 1985).

Broadbent (1977) believes that acoustics in the schools are of cardinal importance because the ear ranks second only to the eye as a corridor to the mind. In a classroom where sound is poorly controlled, some feel the student's attention is diverted from the learning task to the demands of hearing. This sensitivity is supported by some hard experimental data. Broadbent (1979), for example, concluded that the quality of intellectual work is endangered by noise. Further, students and teachers prefer acoustically absorptive environments, especially with audio-visual materials continuing to be a problem. Cohen, Sheldon, and Lezak (1977) stated that noise interferes with the efficiency of students and teachers, lessens attention, and makes concentration on tasks more difficult. Indications, according to Glass (1985), are that the ill effects of noise constitute a negative influence on the lives of millions of people throughout the country, because an excessive noise or sound level slackens and dulls our mental processes, hampers judgment, and reduces the performance of those affected. According to Boggs and Simon (1968) complex tasks are more affected by noise than simple tasks.

A dichotomy becomes apparent when the intensity and frequency of sound and the desirability of specific kinds of sound become at odds. The sound of a saw in the shop, the shuffle of feet passing in a corridor, or the roar of a jet landing at a nearby airport are disrupting sounds to everyone except the student operating the saw, the student passing to another class, or the pilot landing the aircraft. The presence of both wanted and unwanted sound, if uncontrolled, can reach a disconcerting 90 decibel level, and if continued, will provide conditions that interfere with learning (Glass, 1985).

Satisfactory acoustical environments in school facilities requiring effective noise control measures at all phases of the building design and construction should be present in all planning. Cost-effective solutions require a proper balance of mechanical equipment and vibration control and adequate sound-isolating materials. Lack of considerations in any of these areas can result in problems for a new facility. The acoustics of a building should be as important to an architect as the lighting, heating, ventilation, and sanitation. We cannot afford the great loss of human productivity, stated Glass (1985), when it is possible for school buildings, classrooms, and other instructional areas to be designed and constructed in a manner that will provide a sound level conducive to optimum learning climate.

Silverstone (1981) wrote that sound is measured in decibels (db), utilizing an instrument called a sound (or db) meter. An automobile horn, for example, is rated at 110 db, a power mower at 98 db, and a blender at 92 db. Noise becomes harmful to the ear mechanism at 85 db under prolonged contact. To be comfortable in a learning climate, sound should be maintained at 40 to 50 decibels. At 60 db, the environment becomes noisy and above that level sounds begin to interfere with speech.

Color

In reviewing the research on the effect of color for school buildings, Smith (1980) wrote that it is important to be aware that each age level has different psychological requirements for color preference.

Smith (1980) continued by stating that the atmosphere of the primary school should be intimate, secure, warm, and informal with as much of a homelike atmosphere as possible. Colors that would acknowledge this mood are red, blue, green, violet, orange, and yellow. While young children prefer bright colors, high color contrasts are to be avoided because they can produce fatigue. To avoid high color contrast, it would be appropriate to paint the rooms using warm colors (i.e. peach, pink, or yellow) and apply primary color accents for emotional release. Accents include super graphics, furnishings, and concentrations of bright colors in small areas.

Aaronson (1971) conducted a study on colors using a group of college students who were asked to rate the eight colors of the conventional color wheel--red, orange, yellow, yellow-green, green, blue-green, blue, and purple--and the three achromatic colors--black, gray, and white--on a forced-choice, paired-comparison rating scale of emotions adjectives. Red and orange were both rated very similarly as implying active, outgoing, rebellious, and assertive moods. Yellow seemed similarly associated with qualities of activity and outgoingness, but without the dimension of conflict found with red and orange. Yellow-green was associated with outgoing conflict and aggression, while green, the most ubiquitous of colors in nature, showed no particular stereotype. Blue-green seemed calmer and socialized, while the adjectives checked for blue suggested the greatest calmness, socialization, self-awareness, and control. Purple seemed associated with antisocial acting out and white with obedience and conformity. Gray carried a feeling of depression and defeat, and this feeling, in turn, was even greater for black, which was, however, associated with more active feelings of despair than the more passive suffering evoked by gray.

Similar types of studies have demonstrated the influence of color on mood, psychomotor performance, muscular activity, and the rate of breathing and pulse and blood pressure, with warm colors generally resulting in high blood pressure and greater muscular activity, and cooler colors having the opposite effects (Plack & Shick, 1974).

Hanlon (1979) wrote that a number of experiments have shown that people feel warmer in some rooms than in others although the physical temperature was exactly the same. The feeling of warmth can be added to a room through the use of red, yellow, orange, and rich brown colors in furniture, bulletin boards, and carpets. By contrast, if the problem is one of heat rather than cold, one can "cool" the room again by color--blue, green, pale neutrals, and white.

Chromatic aberration is the phenomenon behind the fact that color changes moods, judgments, and in general enhances the quality of life (Ledford, 1981). Jones (1981) wrote that an interior decorator's job is to know about creating different effects on people by varying patterns and colors within a room. When it comes to creating a pleasant combination of carpeting, drapes, lighting, wall structure, and furnishing, a good interior decorator's advice is invaluable.

Thermal Environment

The essential reason for building schoolhouses is to produce a working climate where the physical factors in the classroom are controlled. A controlled environment of heat and cold, moisture and dryness, air motion, and the like must be maintained if learning can progress effectively. Thermal environment is important to the educative process, and learning achievement is closely related to the thermal environment (Day, 1980).

According to Ledford (1981), The Iowa Center for Research in School Administration determined that learners in a model thermal environment (temperature 69-74 degree F.;

relative humidity 40-60%; air movement 20-40 feet per minute) learned better than children in a marginal environment characterized by poor ventilation, over-heating, and uncontrolled humidity. Ledford (1985) continued by emphasizing that administrators and architects should be cognizant of thermal conditions in schools when designing facilities. What appears to be economical at the time of design and construction may prove expensive in terms of inhibiting learning.

Temperature

If the air around the room is too hot or too cold, the individual is kept busy maintaining a regular temperature of 98.6 degrees. The human body, including the brain, contains a thermostat that is quite effective in controlling the temperature. When an unbalance of heat or cold occurs, it will bring about thermal stress and discomfort in which the body loses much efficiency. The preponderance of data on safety, absenteeism, and efficiency in schools leads to the conclusion that human performance deteriorates rapidly at a temperature above or below a relatively narrow comfort zone. Students experience approximately a two percent reduction in learning ability for every degree a room temperature fluctuates from the optimum. On the other hand, in a proper thermal environment, educational leaders believe that the amount of learning by the average student increases from a range of 15 to 60 percent (Day, 1980).

Day (1980) continued by stating that temperature control is easier and less costly to maintain when carpet covers the floor. Research carried out during the winter months showed fuel consumption for the carpeted areas to be from 5 to 13 percent less when compared to the heating of hard floors.

Ventilation

Air filtration provided by heating and cooling systems is an effective means of ventilation. In the process of breathing, people consume oxygen and produce carbon dioxide. People also produce odors from their bodies and clothes. If not cleared, these odors soon become overpowering and reduce learning abilities (Rath & Ittleson, 1981). Another benefit of temperature control, wrote Day (1980), is lower building operating cost. Maintenance costs are lower because there are fewer corridors, windows, and blinds to clean. Less cleaning inside the building is necessary due to the air filtration provided by an air conditioning system. This also produces a good healthy learning climate for the students.

Educational Facilities Laboratories (1960) wrote that additional mechanical exhaust ventilation should be used in toilets, locker-rooms, auditoriums, gymnasiums, and similar areas for the removal of concentrated odors and fumes.

Humidity

Good maintenance procedures become very important in central heating and air conditioning equipment. This equipment controls the humidity of the air and cools, heats, filters, and circulates the air. The smallest room type of air conditioner requires a periodic air filter change or cleaning. The typical installation in a large building demands proper maintenance (George, 1969).

The quality of outdoor air is maintained through constant air movement. As the air moves, impurities are dispersed, carbon dioxide is absorbed by plants and replaced by oxygen, and the air is humidified by rain, evaportranspiration, or by moving across bodies of water (Hathaway, 1987). Prior to central heating and air conditioning, windows were used to control the humidity and ventilation. "Cross ventilation" was a common phrase before the advent of air conditioning. If engineered correctly, cross ventilation can be provided with predetermined accuracy. Proper location of windows and pressure walls can cause air movement in the leeward as well as windward spaces. Air flow can be increased by small openings on the windward side and large openings on the leeward (Wilson, 1981). Many schools across the United States that are partially or not equipped with heating and air conditioning systems still use windows as the only means to control ventilation and humidity.

Indoor Air Quality

The issue of unhealthful indoor air has received expanded attention in recent years as scientists, professional organizations, environmental and health groups, industrial associations, and the government have come to recognize the potential hazards. Despite accelerating interest in general, formal and comprehensive efforts have not been mounted by federal or state governments to determine the seriousness of potential health risks that may affect the student learning climate. An exception is the state of California, which has created and implemented the first state program devoted exclusively to the investigation of nonindustrial indoor air quality (Sexton and Wesolowski, 1985).

Wesolowski (1984) has identified two broad categories of indoor air pollutants. The first includes pollutants that are generated outdoors and infiltrate indoors. The second category involves pollutants generated indoors as a result of human activities and the emission of toxic substances from construction materials, furnishings, and other substances used in the facility.

The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) has provided a data base of sources causing indoor air pollution (1981). Research by Caruba (1984) reveals a series of pollutants commonly found in school buildings. These pollutants, a subset of the ASHRAE group, and their sources are:

1. Formaldehyde from tobacco smoke, particle board resin in furniture and paneling, insulation and resins in carpeting, cloth and adhesives.
2. Radon particles from the ground, masonry materials and water.
3. Asbestos and fiberglass particles from insulation and fire retardants.
4. Pesticides and insecticides both inside and outside the building.
5. Nitrogen oxides from kitchen appliances.
6. Organic chemicals from paints and animals.
7. Microorganisms from people, plants, and animals.
8. Carbon dioxide from human breathing.
9. Allergens from insects and dust (including chalk dust).

In recent years the asbestos issue has been given top priority. According to current trends, formaldehyde resulting from smoking may be the next significant issue to reach the policy formulation stage. Given the awareness of the issue of indoor air pollution, extensive research must be completed and the findings must be widely disseminated to increase public awareness (Tanner & Liska, 1987).

Relationship of Learning to the Physical Facilities

We are beginning to hear more and more about a relatively new discipline called environmental psychology which involves the study of the interaction between human behavior and the environment, generally the man-made environment. Even though the results from this recent development are not too noticeable yet, there are instances of designers, architects, engineers, and social scientists working together for a more humanizing environment (Lindley, 1985).

Landscaping the School Site

Landscaping is an extremely important part of site development. Trees, shrubs, flower beds, and the general arrangement of walks and drives contribute to the general environment of a school building. The design of the building and the layout and development of the site are the important ingredients in creating a learning climate that is educationally stimulating. The building should blend pleasingly into the terrain and the site should accentuate the beauty of the structure (Castaldi, 1977).

One criterion that school administrators find difficult to discuss with many patrons is aesthetics. When this term is used, cost-conscious citizens tend to become enraged. Why should schools be beautiful? Why should tax payers support "frills" in school buildings? These are questions dubious taxpayers raise, especially where all or most of the revenues for capital outlay must come from local taxes. No matter how intense, this questioning should not diminish the importance of aesthetic considerations as they relate to designing a learning climate (Kowalski, 1989). Indirectly, the environment produces consequences in the realm of student attitudes and feelings (Chan, 1988). Robinette (1972) wrote:

> We live in a hard jagged world full of sharp edges and noisy parts. The rounded forms of plants soften and smooth the severity of individual buildings, and abate the overall crescendo of the man-made environment. Plants have a calming, unifying, and organizing quality. (p. 114)

Landscaping should highlight the artistic and aesthetic qualities of a site in making it attractive. An educative learning climate visibly encourages attention and exploration and provides stimulation for socialization. Outdoor instructional areas provide a change of pace for elementary students and allows for creative kinds of play. The learning process is aided by pleasant surroundings and it is a mistake, according to Lindley (1985), to ignore landscaping.

Open Space Schools

Open space schools constitute the first major architectural departure from the traditional "egg-crate" building of one hundred years ago (Weinstein, 1979).

In an extensive review of the research, George (1975) reports that over 50% of all schools built from 1967 to 1970 were open space; in some states, nearly all of the newly constructed schools had open-plan designs. These vary widely, but they are generally characterized by a lack of interior walls and by the existence of instructional areas ranging in size from 2 ordinary classrooms to over 30.

The human learner is today viewed as an exploring, curious, stimulus-seeking being. Getzels (1974) asserts that this vision is most constant with the teaching practices theoretically characteristic of open-plan designs. Other advocates of open space echo this position (American Association of School Administrators, 1967; Eberle, 1969; Educational Facilities Laboratories, 1965), citing the increased opportunities for teacher and student interaction, flexible grouping, and individualized instruction. Their arguments, however, do not go unchallenged. In more than one community, parental response to the new facilities has been vehemently negative and antagonistic, and teachers and administrators have demanded that walls be erected as quickly as possible. Many facilities, once completely open, are now "modified open space"; some are almost indistinguishable from traditional egg-crate schools. While it is generally conceded that the heyday of open space construction is past, a substantial number of such schools currently exist (Weinstein, 1979).

On the basis of the studies discussed in his review, George (1975) concluded that "neither the open space schools or the conventional schools have demonstrated a clear superiority" (p. 63). Additional research has produced similarly equivocal results, although increasing numbers of studies have been more negative than positive in their assessment of the effects of open space, and a few have suggested detrimental effects on particular kinds of students (Weinstein, 1979).

Wright (1975) compared the achievement of fifth graders in a conventional and an open space school. Fifty pairs of subjects were matched on a number of variables and their fifth-grade achievement test scores were compared. On six of nine subtests, traditional school students scored significantly higher. Wright (1975) concluded:

> A consistent and more structured approach to the educational process may be related to better achievement tests. When students are given greater freedom to explore their own interests, they may not use these opportunities to develop the basic skills which are needed for success on achievement tests. (p. 461)

Weinstein (1979) wrote that it is difficult to know how to interpret the existing data on open space schools. In the first place, much of the research has been conducted in schools that have been operating only a few years--hardly a fair test for any new system. As George (1975) acknowledged, "most of the data supplied at this point--adds more to an understanding of how open space schools are functioning, rather than what the effects of fully-functioning open space schools upon teachers and learners might be" (p. 56). Perhaps Dunn and Dunn (1979) better summed it up in this manner:

> Despite the traditional versus the open classroom controversy, we also know that some youngsters achieve better in an informal physical environment (carpeting, lounge chairs, couch, or bed) whereas others learn more easily in a formal setting (desk, library tables, 'hard' chairs). (p. 239)

Multipurpose Room

The multipurpose room is sometimes called the "triple-threat" room, because it seems to be a threat to the three activities normally conducted in it. For example, the flat floor provides poor sight lines to the stage when this space is used for assembly. The chairs and tables must be removed before this space can be converted from a cafeteria to a play area, and vice versa. The use of in-wall tables facilitates the conversion, but they are expensive and not particularly suited to a good social situation during meals. The multipurpose room is not conducive to a good learning climate (Castaldi, 1977).

Kowalski (1989) wrote that virtually all elementary schools have a gymnasium. This area serves at least two major functions: (1) a space for instruction in physical education and (2) a space for recreation (indoor recess or intramural sports). Budgetary considerations cause many school districts to utilize the concept of a multipurpose room instead of the standard gymnasium. A multipurpose room usually is designed to accommodate the combined functions of a gymnasium and cafeteria. Although this concept has financial benefits, it does restrict educational programming--and the larger the school's enrollment, the more restrictive it is.

The Council of Educational Facilities Planners International (1976) also feels that the multipurpose spaces are not in the best interest of students' learning and recommends that schools refrain from building them if at all possible. Special care must be taken in designing areas for multiple use since the shape, size, acoustics, and other environmental factors desirable for one use may be entirely impractical for another. Multipurpose spaces, while they are possible, are therefore seldom better because of the compromises to which they are subject. Their functionalism may be so reduced that they do not serve any of the planned uses as well as separate facilities. The cost of extra storage spaces or special equipment, such as operable partitions needed to achieve satisfactory multi-use, may cancel expected savings.

A serious objection to the multipurpose room, stated Castaldi (1977), is that it gives the appearance and assurance that all of the extra-classroom needs of an elementary school can be met by that single room. It is easy to assume that the single "triple-threat" room can meet certain extra-classroom needs. In reality, of course, such is not the case.

School Facilities Management

The physical condition and general appearance of school facilities constitute the basis upon which many patrons make their initial judgments about the quality of the school and the educational program. As they pass by the buildings, patrons will view the facilities with pride and will be prone to assume that the educational program is being administered in the same style as the school plant management program. Elaborate landscaping programs will improve the exterior appearance, but greater attention should be devoted to the well-kept appearance of the grounds and the adequacy of the building maintenance program as reflected in the exterior of the building (Jordan, 1969).

Baker and Peters (1963) wrote that proper care of school grounds and the exterior of buildings will be a positive factor in school-community relations and will extend the life of the facilities, but efficient custodial and maintenance practices for the interior will have a more direct effect upon the instructional program and learning climate.

Jordan (1969) stated that school plant management programs are divided into two functions--operations and maintenance. These two terms may be defined as follows.

Operations--Activities necessary to keep the school facilities open and ready for use, including cleaning, disinfecting, moving furniture, caring for grounds, operating telephone switchboards, making minor adjustments, and other housekeeping duties which are performed on a regular basis, either daily, weekly, monthly, or seasonally.

Maintenance--Refers to the protection and repair of plant and equipment, especially such protection and repair provided by craftsmen skilled in specific trades. There is a large gray area which is sometimes considered maintenance and sometimes considered housekeeping.

Maintenance is concerned with such things as plumbing, heating and ventilating, electrical systems, cooling, doors and windows, roofing, walls and floors, and other items requiring periodic repair or renovation beyond that normally done as a part of housekeeping.

According to Peters (1954), school plant operations and maintenance rank next to teachers' salaries in current expenditures. But despite their importance, maintenance and operations often are treated as administration stepchildren.

Aside from financial aspects, school plant operation and maintenance programs are important because of their relations to the education program. Children learn from their total environment, and certainly their learning will be influenced by the condition of the physical plant. It is difficult, if not impossible, to instill adequate habits of health and cleanliness when the school is dirty and smelly.

The men and women in the physical facilities work force also play an important part in the educational functions of the school. It is these men and women who provide and maintain an environment that is conducive to an effective learning climate. And they do all this without interfering with the educational process. These dedicated people do most of their work after the teachers and students have left the building for the day or before they return to it in the morning. This often-unseen work force performs an indispensable service that benefits the students, teachers, administrators, clerical personnel, and the taxpayers. It is this group of people that improves learning by providing a proper climate and saves the taxpayers thousands of dollars over the life of a school building by giving immediate and prompt attention to the "little things" before they become big and costly problems (Castaldi, 1977).

Special Considerations

Respect for students and teachers as individuals.

Students need spaces to casually meet and talk with other students and teachers; to join with other students and teachers in small-group study and discussion; and to store their belongings. Schools should be designed to acknowledge and reinforce the professionalism of teachers. Teachers need places to use and store teaching materials and their own property; to make personal phone calls when necessary; to meet and talk with students quietly and privately; and to discuss ideas and make decisions with other teachers (Genevro, 1990).

Warmth. Classrooms, public spaces, and halls should be spacious, bright, and inviting. Vivid colors make a school seem more inviting especially to young children. A sense of spaciousness has a calming effect on children. Every classroom should have abundant windows and natural light (Genevro, 1990).

Security. Small schools are inherently safer than large ones because members of the school community know and recognize each other. Nonetheless, schools should be designed to facilitate the exclusion of unwanted intruders. Play areas should be secure and easily supervised (Genevro, 1990).

Compliance with Title I of the Americans with Disabilities Act of 1990, (42 U.S.C. 12B1). All public schools are considered as public entities. Therefore, facilities that are provided to house educational service must be designed and constructed to eliminate or stop the possibility of discrimination on the basis of one's disabilities.

Summary

In the United States, the earliest schools reflected the belief that buildings per se were of little consequence. In summary, most early schools were constructed with wood, had unattractive and unimaginative designs, and were situated on undesirable land. As public schools became more prevalent (most of the earliest schools were private) and as enrollments began to surge, the school building took on greater importance.

Several factors were critical in the establishment of a new philosophy for educational environments. Urbanization was one of the most significant. The concentration of people in developing cities spawned new interest in cultural activities, technology, and education. Some cities, such as

Boston, erected schools that were much more than the mere shelters of colonial times. In early America, the large-city school system provided models for administrative practice--they were the "trend setters" of their day.

Additionally, elementary and secondary schools were affected by the industrial revolution and the expanding base of knowledge in the world. In the early 1900s, thoughtful educators perceived the need for a fundamental education that went beyond the traditional three "Rs." Health and physical education exemplified components of an expanding curriculum. Trade and industrial education placed new demands upon schooling. These accumulating initiatives produced larger and more diversified facilities as the structures were required to accommodate a broadening curriculum.

The federal government exerted influence upon educational buildings as well. The most notable example can be found in the Public Works Administration. In an effort to create jobs during the economic depression, millions of federal dollars were made available for constructing school buildings. Many of these buildings are standing today; they were more complex and sturdy than their predecessors and included special use areas such as libraries, special instructional areas, and laboratories.

With the passage of compulsory attendance laws and laws mandating that certain subjects be taught, the state departments of education became a greater government force.

As part of this expansion of authority, these agencies became active participants in the creation of schoolhouses by monitoring quality and adequacy. Given what had been the view of school buildings in colonial times, the impact of state department intervention is truly noteworthy. These agencies had the authority to regulate local school board decisions, and via this influence, state officials established criteria for school construction such as mandated health and safety standards (e.g., fire codes, health department codes).

Research in disciplines such as educational psychology and sociology have produced linkages between the facilities and student learning. The acceptance of the theory that such factors (e.g., color, lighting, heating and cooling, and the like) influenced learning, however, did not occur spontaneously. Historical depiction verify that until approximately 1950, the school building was given little consideration as a potential facilitator of effective teaching and learning. After World War II and during the 1960s, the association of environment and learning emerged as a more cogent planning consideration. Although educational practitioners readily accept the importance of physical space, many taxpayers remain skeptical. Even today, demonstrators frequently attack attempts to make schools responsive to the psychological, social, and emotional needs of young children--especially where such planning decisions result in observable cost increases.

One of the truly interesting evolutionary stages of school facilities occurred as a result of school district reorganization. In 1940, there were over 223,000 elementary and secondary schools in the United States. By 1977, this figure had fallen to 106,000. Obviously, reorganization resulted in mergers between small, often single-township schools in rural areas in order to create larger units. The union of small school systems gave birth to the need for larger and more modern school facilities.

The rapid development of technology after World War II also contributed to a changing attitude about school buildings. The effects of technology are exhibited in two ways. First, better building materials were produced (e.g., brick and mortar replaced wood in many building projects). Second, new instructional equipment made its way into the schoolhouse, requiring special considerations for lighting, electricity, and security. Movie projectors and other early forms of audio-visual equipment exemplify those teaching aides. Today, in an era of sophisticated computers, this fact seems relatively unimportant. In essence, the introduction of audio-visual equipment was a discernible step toward closer ties between school design and teaching/learning practices.

CHAPTER III

METHODS AND PROCEDURES

The first purpose of this study was to observe, record, and describe the interface between educational facilities and learning climate in three north Alabama elementary schools. A second purpose of this study was to compare and contrast the results of this study with the research completed by Lowe (1990) that was titled "The Interface Between Educational Facilities and Learning Climate in Three Elementary Schools." This research utilized the same approach and similar instrumentation that was employed in the Lowe study. This study was, therefore, a model of the Lowe study, except for the analysis that compared and contrasted the differences that existed in two distinct environments. This study employed a naturalistic design where the interaction between facility users was observed and recorded. The study employed limited descriptive techniques.

The following research questions were posed to help contain the study within a realistic framework:

1. What are the users' perceptions of the impact of their school's physical characteristics and learning climate?

2. What are the teachers' perceptions of the extent to which their school's physical characteristics meet stated criteria for an effective learning climate based on the following standards as identified by Castaldi (1977)?
    a. Illumination
    b. Noise
    c. Color
    d. Thermal Environment
    e. Space
    f. Location
    g. Maintenance
    h. Esthetics
    i. Safety
3. How do the reactions and behaviors of students and teachers compare and contrast in educational settings that are located in two distinct regions of the United States?

The study was conducted according to the recommendations of Guba and Lincoln (1981). These authors recommended the following sequence of activities:

a. Selection of entity to be studied.

b. Familiarization with the environment to be observed.

c. Observation of student and teacher interaction.

d. Recording observations utilizing thick descriptions.

e. Analysis of observations.

f. Analysis of other (descriptive) data resulting from questionnaires, interviews, or other instruments.

g. Reporting findings.

h. Conclusions based on an analysis of all data

Lincoln and Guba (1985).

Phase I of actual on-site tasks began after the selection of schools to be utilized in this study. The primary step of Phase I was to become thoroughly acquainted with the field sites where the study was to take place. William Corsaro (1980) had strongly recommended the use of what he terms "prior ethnography" (p. 251); becoming a participant observer in a situation for a lengthy period of time before the study is actually undertaken. Such prior ethnography not only helps to diminish the obtrusiveness of the investigator but also provides a baseline of cultural accommodations and informational orientation that will be invaluable in increasing both the effectiveness and the efficiency of the formal work. Corsaro continued by stating that it also prepares the inquirer's mind for what will come later and so serves to sensitize and hone the human instrument.

Phase II of the study was achieved through the use of the following techniques:

a. Observations of student and teacher interaction.

b. Completion of record keeping documents through the completion of thick descriptive accounts.

c. The attainment of teacher perceptions through the use of The Teacher's Educational Questionnaire (Lowe, 1990).

d. Interviewing school users.

The first technique involved observations of student and teacher interaction within the physical facilities of three north Alabama schools. The second technique employed in Phase II was the completion of record keeping documents. These documents were recordings of observations conducted by the researcher. The third technique utilized in Phase II was the gathering of data from teachers regarding their perceptions of the quality of their school's physical facility.

Records of observations were kept by means of the "Thick Descriptive Accounts." This technique of summarizing observations was postulated by Lincoln and Guba (1985). These authors strongly recommended that observations could be thoroughly summarized for analysis through this type of documentation.

Thick Descriptive Accounts involve a written description of several aspects of the researcher's observations. The Thick Descriptive Accounts provided the following narrative format:

a. A description of the setting.

b. A description of the researcher's observations of the physical characteristics of the school interior.

c. A description of a researcher's observations of a school's common areas such as hallways, offices, restrooms, etc.

d. A description of classrooms, observations including statements describing classroom movement and spatial utilization by teachers and students. "The Classroom Spatial Utilization and Migration Observation Form" shall be used to illustrate patterns. (See Appendix C).

Owens (1991) wrote that "thick description" provides meaning of human behavior in the real world in such terms as cultural norms, deep-seated values and motives arising from cherished tradition, and community values. Owens (1991) continued by stating:

> Thick description conveys very much the sense of the web of interrelated contextual factors that is associated with the situation under study. Thick description is more than mere information or descriptive data: it conveys literal description that figuratively transports the readers into the situation with a sense of insight, understanding, and illumination not only of the facts or the events in the case, but also of the texture, the quality, and the power of the context as the participants in the situation experienced it . . . it is unqualitatively "thick" in that much that is meaningful about the context-bound nature of the behavior under study is conveyed. (p. 295)

Teacher perceptions shall be assessed through the use of a modified instrument entitled "The Teacher's Educational

Facility Questionnaire" (Lowe, 1990). (See Appendix D). This instrument sought the responses of teachers to 26 items that stated positive criteria affecting school climate as it related to their school setting.

Interviews were conducted with school users (teachers, support personnel, and administrators) to gather further data related to this project. Respondents were asked to comment on the following five questions that related to the environment of their school and its effect on school climate:

a. How does your building affect the learning climate of your school?
b. Would you please describe the most positive aspects of your campus?
c. What are the negative aspects of your campus?
d. Does the location of the campus enhance or inhibit the effectiveness of your school?
e. What would you do to your school if you had unlimited funds?

A process of Triangulation was employed to analyze data from the interview.

Phase III of the study involved a process of verification. During this phase of the study the researcher sought the cooperation of users of the selected North Alabama schools to review results of observations, interviews, and their responses to questionnaires to verify the accuracy of those summaries that were completed by the researcher.

The remainder of this chapter provides information relative to the process used to gather data and complete reports on each of the targeted schools. The chapter shall include specific sections on the following matters:

a. preliminary procedures and familiarization
b. observation and instrumentation
d. researcher as instrument
d. written instrumentation
e. interviewing
f. recording interview results
g. member checking
h. summary

Preliminary Procedures and Familiarization

Three schools in the Franklin County, Alabama school system were chosen for this study. These schools were selected to correspond, as near as possible, to the schools selected by Lowe (1990) for his study based on the period of time that each edifice was constructed. A second standard used to select the Franklin County schools was that each school selected had an organizational structure to include Kindergarten through second grade which were the grades targeted for observation in both studies. The schools that were selected in the Franklin County area met the following standards for selection: schools selected for participation were selected based on three specific periods. The Belgreen school was selected because it was constructed during the period of the 1920s and 1930s, the same 20-year period that the Rusk school in the Lowe study was constructed. The Red Bay school was selected because it was constructed during the period of the 1940s and 1960s, the same 20-year period that the Sam Houston school in the Lowe study was constructed, and the Vina school was selected because it was constructed during the period of the 1970s and 1990s, the same 20-year period that the Northside Elementary school in the Lowe study was constructed. All procedures, forms for recording information, etc., were similar to the ones used by Lowe (1990). There was also one classroom, K-2, selected from each school that was observed during this study.

The number of teachers and students in the Franklin County School system that were involved in this study are:

Belgreen Elementary School	13 teachers, 232 students
Vina Elementary School	9 teachers, 175 students
Red Bay Elementary School	27 teachers, 521 students

The superintendent of the selected North Alabama school district was contacted. At this meeting, the project was discussed in detail. With permission of the superintendent, preparation for conducting the study began. The first step was the selection of the three schools that participated in the study.

The following school facility characteristics were selected as partial criteria for selecting three campuses on which to conduct the study: (a) building age, (b) design and appearance of the building, (c) building square footage, (d) size, organization, and utilization of instructional space, (e) building maintainability, and (f) building location. One additional criterion for site selection was determined by the time period in which the facility was constructed. Three distinct periods of schoolhouse design and construction have been evident throughout the 20th century: 1900-1930s, 1940-1960s, and 1970s-present. One elementary school for each of the periods of construction described above was chosen.

The second step was to request Mr. James Segars, Assistant Superintendent of the Franklin County School System, to act as liaison. Mr. Segars was a student in the Educational Administration doctoral program at the University of Mississippi; therefore, he was also utilized as a peer consultant. Peer consultation provided opportunities while the inquiry was still in progress to check one's thinking, to raise questions and concerns, and to talk through problems of which the investigator may or may not be aware (Lincoln & Guba, 1985; Owens 1991).

The third step was to request that the superintendent, with the local school board's approval, write a letter approving the study and contact the three building principals whose schools would be involved. The researcher, upon receiving a favorable reply from the school board, through the superintendent (see Appendices A and B), immediately contacted the principals to solicit their cooperation and assured them the study would not include their school if they had any apprehension concerning the research to take place. Questions about the study were encouraged and answered at this time.

The researcher made on-site visits to each of the three schools in North Alabama in the Fall of 1992. The purpose of these visits was to get acquainted and become familiar with the field sites (schools) and the personnel that were involved in the study. According to Lincoln and Guba (1985), researchers and subjects should be at ease in each other's presence to reduce the possibility of bias.

The researcher, with permission of the school principals, participated in faculty meetings on each of the three campuses to provide an opportunity to explain procedures and answer questions that teachers wished to pose relative to research procedures and purpose. During the orientation period of Phase I it was the aim of the researcher to become a well known figure in all areas of each school site. This included classrooms, bus loading zones, parent pickup areas, cafeterias, hallways, and play grounds. By the second semester, the researcher felt that the familiarization process had been successfully completed. Phase II was then ready to begin.

Observation and Instrumentation

The research procedure for this study was in the style or mode of the naturalistic paradigm. To carry out this type of research, observations were of utmost importance. A major advantage of direct observation, according to Lincoln and Guba (1985) is that it provides here-and-now experience in depth. Guba and Lincoln (1981) stated:

> The basic methodological arguments for observation, then, may be summarized as these: observation . . . maximizes the inquirer's ability to grasp motives, beliefs, concerns, interests, unconscious behaviors, customs, and the like; observation . . . allows the inquirer to see the world as his subjects see it, to live in their time frames, to capture the phenomenon in and on its own terms, and to grasp the culture in its own natural, ongoing environment; observation . . . provides the inquirer with access to the emotional reactions of the group introspectively--that is, in a real sense it permits the observer to see himself as a data source; and observation . . . allows the observer to build on tacit knowledge, both his own and that of members of the group. (p. 193)

This investigator conducted as many on-site (which were in the natural setting) observations as time would allow. There were a number of formal classroom observations; however, the majority of observations were unobtrusive and nonreactive. There are two important characteristics of a naturalistic study. One is that a portion of the study does not necessarily end before another can begin. The second is that a naturalistic inquiry unfolds as the study progresses (Lincoln & Guba, 1985). Starting in the first semester and continuing through early spring, unobtrusive on-site observations were conducted. In the early period of observation, scripted notes and tape recordings were used to document the findings. Video-tapes were made of all field sites including grounds and the exterior of all buildings during weekends. The winter months were utilized to observe and record the interactions of parents, students, and teachers with the school facilities. Video-tapes were used to record the traffic pattern of parents picking up and leaving children. School bus loading and unloading zones were recorded. Video-tapes were utilized to record student traffic in school hallways. The interaction of user personnel with the spatial characteristics of the administrative areas, lunchrooms, and kitchens was observed and recorded. Physical education classes and playgrounds were included in the observations at each elementary school. The janitorial personnel were observed at each school site. In addition to video-tapes, scripted notes were taken when necessary and tape recordings made when appropriate.

Researcher As Instrument

Naturalistic inquiry is always carried out, logically enough, in natural settings, since context is so heavily implicated in meaning. Such a contextual inquiry demands a human instrument, one fully adaptive to the indeterminate situation that will be encountered. The human instrument builds upon his or her tacit knowledge as much as, if not more than, upon propositional knowledge and uses methods that are appropriate to humanly implemented inquiry: interviews, observations document analysis, unobtrusive clues, and the like (Lincoln and Guba, 1985).

As a naturalistic study relies heavily on the human as an instrument, the researcher of this study used the "human instrument" as the major instrument during this study. Guba and Lincoln (1981) listed the major characteristics of a human instrument to be as follows.

1. Responsiveness--The human being as an instrument is responsive, both to the environment and to the persons who occupy and create that environment. The result for a responsive inquiry is frequently--and optimally--a situation in which respondents do not adopt the constructs of the inquirer but rather relate their histories, anecdotes, experiences, perspectives, retrospectives, introspections, hopes, fears, dreams, and beliefs in their own natural language, based on their own personal and cultural understandings. The naturalistic inquirer's responsiveness not only calls this uniqueness forth; it is exactly what he wishes to have.

2. Adaptability--The human as instrument is almost infinitely adaptable as a data-gathering device. An IQ test will indeed measure IQ, but it never measures authoritarianism, theoretical orientation, aesthetic inclination, or tendency to schizophrenia. A human being

utilizing himself as a data collection tool, however, can assess any number of things. For example, they can assess artistic orientation by noting the furnishings, wall hangings, art objects, and so on; intellectual interest by making note of the number and types of books in bookcases, as well as the magazines and newspapers lying around; interpersonal family communication styles by observing interactions between family members while an interview is in progress or interrupted; willingness to be open, as evidenced by verbal evasions, body language, and eye movement; power relationships, by watching how persons attending a meeting arrange themselves around power figures; general educational attainment by making note of linguistic and grammatical usage; or ethnicity by observation of dress, dialect, idiomatic expression, cultural reference, and so on.

3. Holistic Emphasis--The world is all of a piece to the naturalistic inquirer; it is not sorted into a set of artificially delimited topics or content areas, as are traditional instruments. The human being sees few, if any, boundaries to the world of his subjects, except those seen by the subjects themselves. The world is viewed in holistic fashion, as a continuous context within which program participants view themselves and their lives as real, true, and having meaning. That holistic emphasis not only gives the inquirer the context--the subjects' and respondents'

"real world"--but it also lends mood, climate, tone, pace, texture, and feelings.

4. Knowledge Base Expansion--The domains of both propositional and tacit knowledge function simultaneously for the naturalistic inquirer, whether he/she is interviewing, engaging in observation, or using any other field method. The information collection progress continues even when he/she is not consciously aware of it. Human beings capture, filter, and process literally thousands of bits of data every day; these are sifted, sorted, and patterned to make a complex but meaningful whole; they represent both tacit and propositional knowledge and are perceived as having continuity.

5. Processual Immediacy--This is the ability to process data immediately upon acquisition, reorder it, change the direction of the inquiry based upon it, generate hypotheses on the spot, and test them with the respondent or in the situation as they are created.

6. Opportunities for Clarification and Summarization --The sensitive interviewer can tell immediately if previous statements were not clear or if they need amplification. The ability to extend and amplify meanings that may have been lost through other means of data gathering is unique to the human inquirer. A person talking can tell you precisely what their last remark meant. The opportunity to probe, to

delve, to scrutinize, or to cross-examine is one that only the human inquirer has.

Summarization, too, is a powerful tool that should be exploited. It serves three principal purposes that cannot be ignored in naturalistic inquiry. First, it acts as a credibility check. It is a way of determining that the inquirer has heard correctly. A second valuable outcome of summarization is to "get the information on record." A third function of summarization is to allow the interviewee or informant to point out key items that may have been missed.

7. Opportunity to Explore Atypical or Idiosyncratic Responses--The human being as inquirer also has the opportunity to explore responses from individuals who have special expertise, who have unique perceptions or roles, or who may provide atypical or idiosyncratic responses. The ability to encounter such responses and to utilize them for increased understanding is possible, in fact, only with human, as opposed to paper-and-pencil, instruments.

Guba and Lincoln (1981) wrote that not only is the naturalistic inquirer concerned with the context in a holistic fashion, but that context is present at every turn. It assaults their conscious and unconscious selves, it insinuates itself into the corners of their mind, it picks at them and disturbs their sleep like small unidentified sounds. Every aspect--sights, sounds, smells--of the lives of their subjects is of intense interest. Like the Western traveler on the Orient Express, new to the Eastern world, every value, every assumption, every "truth" that the naturalistic inquirer owns must be examined in the light of native laws, rules, values, traditions, beliefs, and customs. Indeed the salient features of the emotional and affective landscape are visualized by the inquirer as absolutely essential elements of the inquiry effort. It would never, for instance, occur to the naturalistic inquirer that aspects of the context are "unreal," as naive student fieldworkers will sometimes report. Goffman (1961) states:

> It is my belief that any group of persons--prisoners, primitives, pilots, or patients--develop a life of their own that becomes meaningful, reasonable, and normal once you get close to it, and that a good way to learn about any of these worlds is to submit oneself in the company of the members to the daily round of petty contingencies to which they are subject. (pp. 9-10)

It is in the totality of this meaning, reasonableness, and normalcy in each context and setting that the naturalistic inquirer seeks to understand, to explain, and to describe (Guba & Lincoln, 1981).

Written Instrumentation

As stated previously, this study followed the naturalistic paradigm of research that recommends the human as the primary instrument method for gathering data. The naturalistic method gives leeway to use other instruments if they are not the major instrument and are introduced into the research after it is well underway.

Lowe (1990), in addition to the "human instrument," developed two instruments that were used in his study. The title of the instruments were: "The Teachers' Educational Facility Perception Questionnaire" and "The Classroom Spatial Utilization and Migration Observation Form." These instruments, in a modified form, were used in this study.

The Teachers' Education Facility Perception Questionnaire was developed to assess the perception classroom teachers had about the campuses on which they were employed. The instrument, according to Lowe (1990), was designed to gather teacher perceptions concerning building age, design and appearance, size, organization and utilization of instructional space, and campus aesthetics. This questionnaire was distributed by the researcher in February, 1993, to all elementary teachers who were involved in this study. A two-week turn around was projected for completion and return. One elementary teacher from each school was selected to be responsible for the collection of completed instruments.

The Classroom Spatial Utilization and Migration Observation Form was utilized in the three classrooms, selected by the researcher, K-2, on each campus for formal observation. In an interview (August 24, 1992) with Dr. Jerry M. Lowe, he stated this instrument was developed to record student and teacher movement (or migration) patterns as they interacted with the spatial characteristics of the classroom. An interval scale on the instrument allows the researcher to record the level of usage in the areas of the classroom throughout a typical class period of 40 to 45 minutes. Lowe continued by pointing out that the instrument allowed the researcher to gather information related to the physical environment and the spatial utilization practices of the classroom teacher while being observed. Lowe also stated the instrument provided a space for scripting any interactions between teachers and students with the physical and ambient environment of the classroom. During the winter months, observations were made and recorded by this researcher utilizing the Classroom Spatial Utilization and Migration Observation Form. An exact date for observing selected classrooms on each campus was coordinated with each principal and teacher involved in the research.

A major aspect of determining spatial and migration usage was to compute the percent of the total instructional areas that was used by pupils during the observed 40 to 45 minute class periods. The method to determine the aggregate and refined percent of area use of classroom space by students was as follows:

a. Each space in the classroom was provided an alphabetical coding from A to D representing each instructional space.

b. Teacher and student location were plotted on a grid at two-minute intervals.

c. The total number of students located in each instructional area was computed and totaled for each of the two minute intervals.

d. Occupation of areas was calculated to determine what percent of students occupied each of the four areas during the 40 minute intervals. This computation was completed by the following formula: Total Students in Area divided by Total Class Enrollment.

e. The percentage of students occupying each space was plotted on the grid for each two minute interval.

f. The sum total percent of occupancy was calculated by adding each of the percentages of the 20, two-minute time periods for each space which was occupied by students during the 40 minute period. This calculation provided the aggregate percent of area use by students in each instructional area.

g. Total aggregate use for all four areas was summed.

h. Each of the four areas was divided by the summed total to determine the "refined aggregate percent of area use." This calculation was computed by the following formula: Total for Specific Use for

Category A to D divided by Summed Total of
Aggregate Area Use.

Interviewing

Of all the means of exchanging information or gathering data known to man, perhaps the oldest and most respected is the conversation. Simple or complex, face-to-face exchanges between human beings have served for eons to convey messages, express sympathy, declare war, make truces, and preserve history. As an extension of that heritage, interviewing--the "conversation with a purpose" (Dexter, 1970, p. 136)--is perhaps the oldest and certainly one of the most respected tools that the inquirer can use (Guba & Lincoln, 1981).

The interview is more flexible than the questionnaire, allowing questions to be restated if they were not first understood. Interviews are more personal than questionnaires, and they are a better exploratory tool. They are also better in sensitive areas (such as money, politics, and sex); they permit the interviewer to note the respondent's affective responses (that is, to make note of nonverbal cues or of how the respondent says what he says); they approximate real-life situations more closely than questionnaires; they don't require literacy on the part of the respondent; and they usually end with better sampling because there are fewer turndowns (Guba & Lincoln, 1981; Mishler, 1986).

Structured interviews, according to Dexter (1970) are likely to be used in situations in which representative samples of persons are asked identical questions about something that interests the investigator. All respondents are taken to be of equal importance. The object is usually to get representative or "typical" responses, and "a deviation is ordinarily handled statistically" (p. 6). Examples of structured interviews, according to Guba and Lincoln (1985), would include a physician filling out a health history questionnaire for a new patient, a survey researcher collecting consumer preference data, a precinct worker collecting information on party preferences door-to-door, or a personnel officer interviewing a job applicant.

The unstructured (intensive, "key" investigative, "elite," specialized, nonstandardized, or "in-depth") interview is quite another matter. Unlike the structured interview, the unstructured or "elite" interview is much less abrupt, remote, and arbitrary than is the structured interview. It is used most often in situations where the investigator is looking for nonstandardized and/or singular information. As a result, it tends to stress the exception, the deviation, the unusual interpretation, the reinterpretation, the new approach, the expert's view, or the singular perspective. The unstructured interview has a very different rhythm from that of the structured interview. It tends to be very free flowing, and it is likely to move the way the respondent causes it to move because of the cues that they provide (Guba & Lincoln, 1981; Marshall & Rossman, 1989).

Some examples of the kind of interviewing that might be called unstructured include tracing patterns of dope addiction and characterizing the life-styles of successful professionals; the debriefing of disaster victims; garnering the perceptions of deans of arts and sciences about a school of education; finding out why persons participate in nude beach behavior; discovering the different types of discipline problems that teachers face in their classrooms; discovering what the perceptions of Harvard classmates of Jack Kennedy were when he was a student with them; and many others (Guba & Lincoln, 1981).

In a naturalistic study, Guba and Lincoln (1981) and Lincoln and Guba (1985) stated their preference lies with the form of interviewing known as "elite," "in-depth," or unstructured. The search for contextual meaning, for situation-explicit and value-resonant grounding, may demand that more open and responsive methods be employed. The unstructured interview is the one most likely to cause those express intents to emerge. The unstructured interview will be used in this study. A stronger statement, concerning unstructured interviews, was also made by Guba and Lincoln (1981):

> Now it is generally agreed that a variety of methods may be employed in field research. It is our belief,

> however, that interviewing--whatever form it might take, but particularly the unstructured interview--is the backbone of field and naturalistic research and evaluation. (p. 154)

Recording Interview Results

Two means for recording the interviews during this research were utilized. Note taking or scripting was one method. Tape recordings, using open and unobtrusive methods, was the second means employed. A random selection of user personnel for interview was made from the three elementary schools involved in this study. User personnel included teachers, administrators, and support personnel.

Lincoln and Guba (1985) pointed out that the information obtained from any interview--and, as the study proceeds, from the accumulated interviews--should be subjected to triangulation and further member checking. Owens (1991) continued by stating that in triangulation the investigator uses a number of sources of information and data not necessarily about the same things. For example, as themes begin to arise from interviews or documents or observations, they are cross-checked with other sources so as to verify them, to check the accuracy of information, and to test different actors' perceptions of given events. Whenever possible, the researcher should use multiple data-gathering techniques including interviews, document analysis, self-reports, questionnaires, observation, and other approaches. This ensures the potential for cross-checking and verifying data (Fetterman, 1989; Guba & Lincoln, 1981; Owens, 1991).

Member Checking

Owens (1991) described the importance of member checking in a naturalistic study by stating:

> The investigator continuously corroborates data, information, and perceptions with relevant others in the organization being studied. Quite literally he or she may go to an actor in the situation and say, "Some people say that [such and such] is typical of the way things are done here. What do you think?" The process of member checks is perhaps the single most important means available to the naturalistic inquirer for establishing the credibility of an inquiry. (p. 237)

In other words, according to Lincoln and Guba (1985) member checking occurs continuously. Many opportunities for member checks arise daily in the course of the investigation. A summary of an interview can be "played back" to the person who provided it for reaction; the output of one interview can be "played" for another respondent who can be asked to comment; insights gleaned from one group can be tested with another.

This was the procedure used in this study. Respondents were given the opportunity to hear and make comments on taped interviews. Comments and input were solicited from user personnel on observations made by this investigator. All information received from respondents was used to correct errors or add to the research.

Analyzing and Reporting Data

Since this study utilized the naturalistic design and other techniques for gathering data, a summary of the methods used in the analysis and reporting of gathered data has been provided below.

1. Observations.

   A narrative description was provided that analyzed four areas to be observed by the researcher. These areas included the setting, interior observations, classroom observations, and exterior and maintenance observations. The observations included factual findings that were based totally on researcher analysis. The basis of factual findings related to accepted standards that had been established for school plant planning and maintenance.

2. Interview

   The researcher narratively described the responses of selected personnel to several questions. The questions to which teachers, principals, parents, and other employees were asked to respond are:

   a. How does your building affect the learning climate of your school?
   b. Would you please describe the most positive aspects of your campus?

c. What are the negative aspects of your campus?

d. Does the location of the campus enhance or inhibit the effectiveness of your school?

e. What would you do to your school if you had unlimited funds?

3. Responses to the Teachers Educational Facility Perception Questionnaire.

Responses of teachers to the 26-item questionnaire were reported, based upon frequency of response, in tabular form. Frequency of response to each of the 26 statements that related school facilities and grounds to effective learning climate were recorded and reported. A narrative description of the analysis of these data was provided.

4. Analysis of Spatial Utilization and Migration.

Tables and graphs were used to describe patterns of classroom utilization. The same procedure was employed to record the movement or migration of teachers and pupils. A narrative description of each table or graph was provided in order to give additional understanding or movement patterns that exist in each observed area.

5. Comparative Analysis.

Three schools in the Franklin County Alabama school system were chosen for this study. These schools were selected to correspond, as near as possible, to the schools selected by Lowe (1990) for his study. All procedures, forms for recording information, etc. were similar to the ones used by Lowe (1990). There was also one classroom, K-2, selected by the researcher, from each school, that was observed for this study.

6. Setting

The setting of each school was described, recorded, and compared to Lowe's study. Such information as date of construction, size of site, relation of site to roads, streets, etc., student and teacher population, ethnic breakdown, parking and traffic pattern, landscaping and surrounding area was used.

7. Interior Observation:

Interior observation included a description of the entrance area of each school. It also included the building layout, floor covering, lighting, administrative office, cafeteria, hallways, restrooms, teacher lounge, classrooms, and any other feature that may impact the facility learning climate. These descriptions were recorded and compared to the Lowe study.

8. Classroom Observation:

Description of classrooms observed included:

a. Size of room

b. Windows--lighting--heating and cooling

c. Furniture and arrangement to include visual aids.

d. A graphic representation was drawn of each school room, K-2, selected for observation.

e. The Classroom Spatial Utilization and Migration Form, developed and used by Lowe (1990), was utilized to record movements of students and teachers during the observation periods of selected classrooms.

Information received was analyzed and compared to Lowe's findings.

9. Exterior Observations and Maintainability:

Observations were carried out, but not limited to the following:

a. Playgrounds--condition and type of equipment; size of playground; observation of equipment used.

b. Description and utilization of physical education facilities.

c. Maintenance and appearance of buildings both interior and exterior, including custodian care.

d. Care of yard and shrubbery.

e. Bus loading and unloading zones, including parents picking up and unloading children. Teacher and student parking areas.

These areas under Exterior Observations and Maintainability were recorded and compared to Lowe's study.

Summary

Lee Rainwater (1969) was very effective in summarizing naturalistic inquiry method when he wrote:

> The principal attitude which directs my work is one of puzzled curiosity. I have always felt that I don't understand the people around me very well, and with that feeling has come a strong curiosity to try to figure out exactly what they are doing and why they are doing it. This attitude is perhaps not particularly distinctive to me, but the form by which I have sought to resolve that puzzled curiosity during my professional life is perhaps more distinctive. I have always been drawn to styles of sociological and psychological work that partake of the naturalist's approach--that is, an approach in which there is an effort to observe the forms and behaviors in which one is interested until one feels one understands how they hang together, and then depict as accurately as possible what one thinks he has observed so that others may apprehend that reality, and perhaps by replicating the observations validate it. This kind of activity has seemed worthwhile . . . for three reasons. The first is a belief in the intrinsic, almost aesthetic value, of an accurate and penetrating depiction of reality. In addition, I have always felt that if men are to achieve their goals, if they are to avoid troubles and construct a society which meets their needs as fully as it might, they need to understand their world better. Finally, I have always hoped that if the social naturalist's task is done well, he provides the best kind of grist for the mill of the social theorist. As a person who has neither interest in, nor talent for doing other than heavily grounded theoretical work, the theorist, would be more successful in his work if he could draw upon good descriptive work.
>
> A further distinctive characteristic of my work has been the reliance on qualitative data--from participant

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> observation, open-ended interviewing, and protective techniques. Such methods have always seemed to me to more closely replicate human life as it is experienced than the more controlling techniques of questionnaires, laboratory experiments, and the like. (p. 48)

The naturalistic research method was used for this study. In addition, the study was conducted in the natural setting (school sites). Research procedures were carried out in three major phases. Phase I began with the selection of the schools for participation in the study and familiarization. Phase II was organized to accommodate the focus of the study. In-depth observations and on-site interviews were performed. In addition, two assessment instruments were utilized. Phase III provided the opportunity for members of the selected North Alabama School District to examine, verify, and lend credibility to the findings of the inquiry. "Thick Descriptive" case studies were developed for each of the elementary school campuses in the study.

CHAPTER IV

THICK DESCRIPTIVE ACCOUNTS AND DATA ANALYSIS

This chapter shall provide the basic information on all data related to this study. The chapter includes the following sections.

a. A brief description of Franklin County, Alabama;

b. Thick descriptive accounts of the schools targeted for the study. These accounts include the following:

   1. a description of the setting (general observations), which will provide a general narrative description of the outside area and specific demographics;
   2. a description of interior observations (the general characteristics of the building);
   3. a description of administrative offices;
   4. a description of lunchroom and restroom areas;
   5. a specific description of K-2 classrooms;
   6. a specific description of the observations which occurred during specific periods of kindergarten, first grade, and second grade classes;

7. a description of the exterior observations and maintainability;
8. an analysis of data relative to the perceptions of users and teachers; and
9. a summary for each school targeted for the study.

c. Comparisons and contrasts with the Lowe (1990) study.

Franklin County, Alabama

Franklin County is located in the northwestern part of the State of Alabama, bordered on the west by Mississippi, and to the north, approximately 35 miles, is the Tennessee state line. The county seat of Franklin county is Russellville. The soil is one of the most important natural resources of the area, supporting livestock, field crops, and forest. The major crops include cotton, hay, soybeans, and corn (Franklin County Chamber of Commerce, 1992-93).

The population figures from the 1990 census show that Franklin County has an estimated population of 27,814. This census also showed that of the total, 95% of the population is white, 4% black, less than 1% American Indian/Alaskan native, and less than 1% Asian/Pacific Islanders, with less than 1% of Spanish origin (Franklin County Chamber of Commerce, 1992-93).

Franklin County has two public school systems, the Russellville City School System and the Franklin County

School System. There are currently 2,168 students with 136 teachers in the Russellville City School System and approximately 3,000 students with 215 teachers in the Franklin County School System (Franklin County Chamber of Commerce, 1992-93).

Three schools within the Franklin County School System were selected for this study. The schools chosen are the Belgreen, Red Bay, and Vina Elementary Schools. The three schools are K-12; however, the elementary and high schools are structurally separated. In addition, the upper elementary and primary (K-2) are also separated by:

a. Classroom designation
b. Bathroom designation (also size of bathroom fixtures)
c. Scheduling:
    (1) lunch time
    (2) play periods
    (3) snack time
    (4) time for leaving school, example, K goes first, followed by first grade, and so forth.

Belgreen, Red Bay, and Vina Elementary Schools

In following, primarily, the naturalistic paradigm, Chapter IV contains a thick descriptive account of on-site observations conducted at the Belgreen, Red Bay, and Vina Elementary Schools in the Franklin County School System. In addition to the thick descriptive accounts, two forms of paper/pencil instrumentation (Teacher's Educational Facility Perception Questionnaire and Classroom Spatial Utilization and Migration Observation Form) were used to gather in-depth data at each school.

A kindergarten room, a first-grade room, and a second-grade room were selected from each site to gather the in-depth data. The results of this instrumentation appear in graphic form. The information which follows pertains to the three targeted schools and data are presented for each school based on the following format: (1) the setting, (2) interior observations, (3) classroom observation, (4) exterior and maintenance observations, (5) users' perceptions (users include teachers, administrators, and support personnel), and (6) a comparison and contrast between schools in the Lowe (1990) study and schools in this study.

Belgreen Elementary School

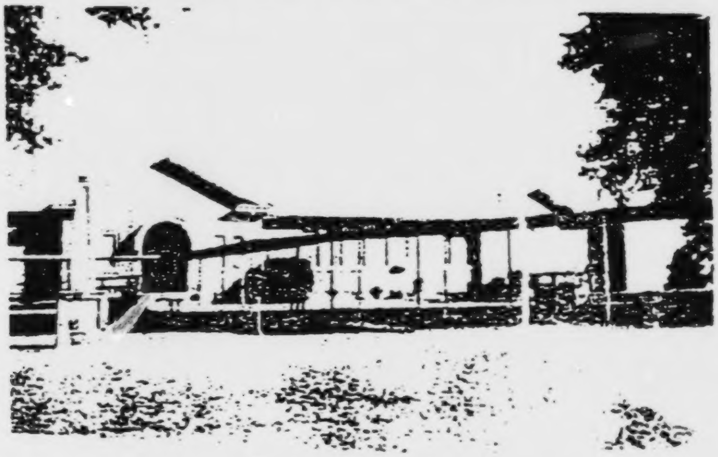

Figure 4.1. Photograph of Belgreen Elementary School

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Setting (General Observations)

The Belgreen Elementary School was constructed in the school year of 1932-1933 in the Belgreen Community. This location is on County Highway 187 approximately 1/4 mile south of the intersection of State Highway 24 and County Highway 187.

The elementary school houses 232 students, 13 teachers, two aides, one secretary, one administrator, four food service personnel for K-12 grades, and one janitor for the entire school. The student ethnic breakdown is 100% white. Forty-five percent of elementary students are on free or reduced lunches. The principal stated there were several more eligible children, but parents would not accept what they called "charity." He also stated this was a low socio-economic area. Figure 4.2, below, presents a graphic illustration of the setting of Belgreen School.

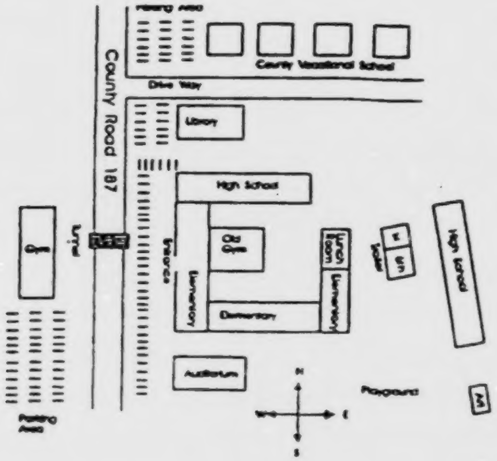
Parking Area
County Vocational School
Drive Way
County Road 187
Library
High School
Gym
Old Gym
Lunch Room
Elementary
Elementary
Elementary
High School
Auditorium
N
E
S
Playground
Parking Area

Figure 4.2. Belgreen School (Graphic representation is not to scale.)

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County Highway 187 starts at State Highway 24 and terminates approximately 25 miles south at U.S. Highway 43. The intersection of Highways 187 and 24 is located about 1/4 mile north of the Belgreen campus. Starting at the intersection and traveling south on 187, as one approaches the Belgreen School Campus, the Area Vocational School may be observed on the east side of the highway. The Belgreen School library, the main school building, and the auditorium are located near the vocational school. On the west side of the highway, directly across from the main school building, is the gym. There is a tunnel under the highway that students should use to walk from the school building on the east side of the highway to the gym on the west side of the highway. The highway traverses the Belgreen campus.

There is a constant and heavy volume of traffic on Highway 187. In addition to the local traffic, large log trucks, sand and gravel trucks (a sand and gravel pit operates approximately one mile south of the school), and coal trucks are frequent travelers on the highway. The only speed signs in close proximity of the school are the ones reading 25 MPH during 7:30-8:30 a.m. and 2:30-3:30 p.m. The front of the main school building is located approximately 125 feet from Highway 187.

A first-come, first-serve parking area is located on the east side of the highway extending from the area in front of the auditorium across the width of the main school building around the south side to about 25 feet from the main building (see Figure 4.2). The parking area along the highway can be a problem. Cars must back onto the highway to gain access to the main road. In the area north of the main building parents pick up and drop off their children in front of the library. This area is directly in the rear of cars parked along the north side of the parking area. This can cause traffic congestion if parked cars do not wait until parents who are picking up children leave the area. Buses also experience problems. Drivers who are attempting to unload must back into an area located near the front of the vocational school. Often, the front bumpers of buses are within 10 feet of the highway. This presents a dangerous situation for children. Another situation that compounds problems related to children being delivered to school or picked up is that some parents or visitors who cannot find a parking spot in front of the school building will park on the west side of the highway and walk across the highway or cause their children to cross the highway.

There are four beautiful huge oak trees in front of the main entrance of the school. Along the covered sidewalk there are nine concrete benches approximately 25 feet apart. These benches are strategically placed along the sidewalk to a point near the main entrance. As one enters the main building there are four broad steps. An individual may proceed straight ahead or turn right or left in order to gain access to specific areas. The right turn leads down a sidewalk (that is not covered) to the auditorium that is separated from the main building by about 10 feet. The left turn leads down a covered walk to the library that is separated from the main building by approximately 15 feet. Several benches are located along this walkway. On the edge of the front lawn are four original lamp posts, evenly spaced, across the width of the main building. The posts are concrete with a round glass white globe on the top and standing approximately 10 feet high. The fixtures are in excellent condition.

Standing in front of the main school building as one looks west across Highway 187 the following may be observed. (1) An old dilapidated wooden house is located to the northwest. (2) South of this is a small cinder block store with two uncovered gas pumps out front. (3) A vacant area that is grown up in bushes and weeds can also be seen. (4) Next to this area is a rather nice home with two or three cars, a truck, small trailer, and some farm equipment. (5) The school gymnasium and a parking lot may also be observed from this location.

On the east side of the highway the south boundary line is indicated by a four foot chain-link fence. The fence runs within five feet of the auditorium. A farm house is barely visible behind some tall bushes and shrubbery approximately 60 feet south of the auditorium. About 10 feet south of the fence is an old out-house with the door missing and very much in disrepair. Next to this is a large barn that appears to need repairs. Between the fence and farm house is an open shed that appears to be used for a workshop and parking farm equipment. An old pickup truck, which does not appear to be in running condition, is parked almost touching the fence. All of this is visible from the highway or when approaching the school buildings from the front.

The area Vocational School borders the north boundary of the Belgreen School. This does not enhance or inhibit the appearance of the school. The Belgreen school campus originally contained 39 acres. Five acres were taken from the campus for the construction of the Area Vocational School. The Belgreen School campus is located near the center of Franklin County, therefore, it was the ideal location for the Vocational School. All high schools bus their students (who take VO/AG) to the vocational school and return them to their respective schools after classes.

The campus of Belgreen consists of 35 acres; however, the terrain is so uneven it is difficult to plan further construction. One teacher stated:

> I hate it that the gym is on the other side of the road, but golly, the ground is so hilly and uneven they got nowhere else to go. You take behind the school there is a great big huge hole. They could never afford to fill it up to build on.

One must travel down another steep hill to the playground; however, a sidewalk has recently been constructed to provide access to the playground area. The playground is equipped with a variety of equipment that appears to be adequate in accommodating the students. A six-foot chain-link fence, in excellent condition, encloses the playground. Although visits were made in the winter months, the grass and shrubs had the appearance of having been trimmed and well maintained.

The school building is a typical structure that was built in the 1920s and 30s in the south. The entrance is oval shaped and constructed of brick with a cement marker overhead that has the school's name engraved. The four wide steps to the entrance lead up to double doors that are solid wood from the center down and small glass panes in the upper section. The school is constructed of three types of colored bricks: red, black, and dark tan. The bricks have worn well with age. The building has a gable roof with fiberglass shingles. The boiler unit is located in the basement under the old gym. Wires providing electrical power to the building are overhead and serve the building from a transformer located on a pole on the north side of the library. Sidewalks lie in front of the school near the front parking area and lead to the front entrance. The sidewalks then extend to the library to the north and the auditorium to the south. The sidewalks have worn with age and contain minor cracks; however, they are in good condition. A two-room portable classroom, 30 feet by 65 feet, has been placed to the rear of the main building near the high school science building. A kindergarten class occupies one room and a sixth-grade class occupies the other room. The portable building has a gable roof covered with metal. The library was built in 1939 for a vocational building and converted in the 1970s into a library. It is red brick with a gable roof and fiberglass shingles. Private contractors put plastic siding on the exposed wood parts of the building (gable ends, eaves, post, so forth) during the period of this study.

The researcher observed the interactions of teachers and students with the physical characteristics of Belgreen Elementary School. An account of these observations is provided in the following sections of this chapter.

Interior Observations

When entering the Belgreen School a spacious hallway may be observed. The principal's office is to the left, adjoining the secretary's office. To the right is the counselor's office and next to it is a small teacher's workroom that contains a copy machine and no other furniture. The entrance hallway leads to a "T" shaped opening. The hallway to the right (south) leads to the elementary classrooms. Walking in an easterly direction, one may pass these classrooms and take a 90° turn. At this point, the restrooms for elementary boys and girls are to the left. Six large six-foot windows extend from this location to the end of the hallway. On the right side of the hall are elementary classes. As stated earlier, this building was constructed in the shape of a horseshoe with the original auditorium and gym located in the center. Students who walk along the entrance hallway may turn right to the elementary classes, left to the high school, or go straight into the old gym which has been converted into an elementary gym for use during inclement weather. The gym is also used for snack time for both elementary and high-school students. It contains four drink machines, four snack machines, and a deep freezer for ice cream. The gym, hallways, and classrooms are paneled 4 feet from the floor with the original tongue and groove, 4-inch boards, painted brown. A major renovation of the building was completed in 1984. All windows, doors, and walls are in excellent condition. The old oily wooden floors were removed and replaced throughout the building with new subflooring that is finished with a light gray tile. A few offices and the teachers' lounge have been carpeted. The hallways, classrooms, and all gym walls are painted a light cream color. Nowhere in the building were any acts of vandalism observed. The ceilings, except in the gym, were lowered to 9 feet and constructed with white acoustic tile, and fluorescent lighting exists in all classrooms. One can observe a large glass-covered bulletin board that is located near the gym. This bulletin board is used to display announcements of school events. Large decorative letters are used for the announcements and the schools colors are evident on the bulletin board. One of the prominent signs which remains on the bulletin board at all times is "Go Bulldogs." Several announcements were made by using the bulletin board during the course of this study. Children's school work was affixed to the walls on both sides of the hallway (the 4-foot panels make an excellent place to attach them).

Lighting in the gym is excellent. There are four double windows, 3 feet by 6 feet, on the north and south sides of the gym. In addition, the overhead lighting consists of eight 200 watt incandescent lamps that hang approximately 2 feet from the ceiling. The stage was enclosed, and a teachers' lounge and a small room was constructed in this space. The small room had a brown carpet, a desk, table, and chairs. It was used for a conference room by teachers, parents, students, or administrators. The furniture did not match; however, it was adequate for a school conference room. The teachers' lounge was larger and contained 252 square feet with brown carpet. The lounge has a matching chair and couch, a coffee table, mid-size round table, a copy machine, and a three-drawer table on which a coffee pot was placed. A small refrigerator, microwave oven, and a folding table supporting teachers' mailboxes were also located in the teachers' lounge. One wall in the teachers' lounge was used for a place to post memoranda and other information pertaining to teaching. A window air-conditioner provided ventilation for the lounge. The ceiling was constructed using white asbestos. During the renovation the ceiling was lowered to a height of 9 feet. There were three, 4-foot fluorescent light fixtures (with two bulbs) placed flush with the ceiling.

When one teacher was asked in a taped interview what she thought about the teachers' lounge, her reply was:

> Did you ever see our old teachers' lounge? In comparison to our old teachers' lounge this place is a palace. In the old lounge we did not have a copy machine, nor anywhere to sit down either.

A couple of other teachers stated that although it was nice of the principal to repair it for them, they just did not have the time to enjoy the lounge. During the observation period it was noted that teachers came in for mail, prepared a cup of coffee, then took it with them to their work stations. Very little socializing took place in the lounge.

Students in primary grades must walk down a steep flight of stairs in order to gain access to the cafeteria or to the outside playground area. The steps are rather narrow and difficult to manage for students enrolled in primary grades, especially kindergarten. The noise level is high when the children are using the stairs. One teacher commented about the steps during a taped interview:

> You really got to watch that they don't get hurt, especially at the beginning of the year. It's just dangerous for them. They forget sometimes what you told them.

Persons leaving the steps can make a 180° turn down a narrow hall to three classrooms. The teachers in this area stated that the noise level of children going up and down the steps is detrimental to the learning process. The teachers on the upper level near the stairs also agreed that the noise level had a negative impact on the learning climate. Should an individual wish to walk in another direction (instead of taking a 180° turn at the bottom of the steps), it is possible to climb two steps and turn right to exit outdoors or left down a spacious hallway past two upper elementary classrooms to the lunchroom.

There are four areas of concern that produce a high noise level for the elementary classes:

1. The steps at the end of the hall.
2. Restroom breaks that involve children forming lines to use the restrooms and to gain access to the water fountain after play period.
3. Inclement weather when elementary students use the old gym for play or P.E. The noise for the gym disturbs almost all of the elementary classes on the main floor.

4. Snack times, especially during inclement weather, when the high school students have a tendency to wander into the hall.

Administrative Offices

The principal's office was located adjacent to the main hallway at the entrance to the building. The office housed a secretary and a clerk, with two desks and chairs, two computers, double filing cabinets, a copy machine, and a 5-foot long waist-high counter. The area from the counter to the entrance door measures 4 feet. In this area visitors, students, and others must stand (no chairs) to conduct business or wait to see the principal. The entrance to the principal's office is located approximately 3 feet from the end of the counter. The outer office is crowded; it is an 8-foot by 24-foot room with just barely enough room for the secretary to pass between the desk and the other equipment. The floor has brown carpet.

The principal's office is large in comparison to the outer office. It measures 504 square feet, not including an 81-square foot storage room and an 81 square foot private bathroom that was located on the east wall of the office. The furniture consisted of a large executive desk and chair, two filing cabinets, a small desk with a communication system on top, a couch with matching chair, as well as two additional chairs. A light blue carpet was on the floor and two 3-foot by 6-foot windows were on the north wall. A window-type air conditioner completed the furnishings. The principal's office was pleasant in appearance and the furniture appeared in excellent condition. The researcher observed personnel standing in the hallway at various times during the day as there was no formal waiting area.

Lunchroom and Restrooms

The lunchroom consisted of four rows of tables with 16 chairs on each side. This arrangement allowed 128 students to be seated in the lunchroom. Kindergarten classes are scheduled for lunch first followed by first grade. The second and third grades dine next and higher grades are scheduled according to a grade progression sequence. The table and chairs are all the same height; however, heights of table and chairs did not appear to affect the ease of dining by primary grade students. There is a solid row of windows on the west wall of the dining room. During the day that observations occurred in the cafeteria, it was very sunny; however, the large trees outside shielded the windows to the extent that even with all the lights on it was rather dark in the dining area. The lights were single bulb, 8 foot fluorescents that hung down from the ceiling about 18 inches. There were eight fixtures in the dining area. The walls were constructed of concrete blocks painted white from the ceiling down to 4 feet from the floor; at this point the blocks were painted brown. The floor was light gray commercial tile. The ceiling had open beams painted white.

The lunchroom had central heating and cooling. The kitchen appeared adequate and well-equipped. There were four full-time lunchroom workers and one part-time lunchroom worker for the entire school. The lunchroom was clean; however, the windows needed washing. During an interview with the head cook (lady in charge), she revealed that the regular cafeteria workers were responsible for cleaning the windows. The school had only one custodian; therefore, lunchroom workers and school teachers were responsible for cleaning their own assigned areas. During lunch period two student workers were assigned to help with the garbage, clean floors, and assist with other cleaning duties associated with providing child nutrition services.

Student restrooms were located near the center of the area designated for primary grades. There were separate restrooms for boys and girls. The boys' restroom is 128 square feet with a tile floor (same as the rest of the building), three urinals, four commodes partitioned off, and two wash basins. The girls' restroom had five commodes and two wash basins. This restroom is also 128 square feet. The tile under and around the urinals in the boys restroom was observed to have cracks. The custodian was asked by the researcher what could be done and he replied:

> I got this down already. This summer I'll take the tile up about a foot below the cracks and replace the tile. If I don't it will get a terrible odor. You got to stay on top of things like that. I don't want the school smelling bad and the principal don't either.

Although the teachers at Belgreen (all Franklin County Schools) have to clean their own rooms, they have respect for the custodian. During this research period the custodian, when observed, was always busy.

Classroom Observations

The classrooms in the main building at Belgreen Elementary were approximately the same size. Some differences were noted, however, in the arrangement of some of the rooms. These differences were evident, primarily in the location of the doors. The classrooms were approximately 660 square feet with light gray linoleum tile floor coverings. The ceilings were lowered to 9 feet with 11 two-bulb, 4-foot, cool-white fluorescent lights flush with the ceiling that was constructed with white acoustic panels. All windows were in excellent condition and could be opened to the outside. Each classroom had a window-type air condition unit. There was evidence of glare in rooms where windows faced the west. Windows were equipped with shades that were pulled down to keep the sun out during afternoon classes. The teacher stated that sun rays did not present a problem because shades were used to protect the visual environment and air conditioners regulated the thermal environment; however, it was observed that some glare was present on sunny afternoons. There were two large brown chalk boards, with a small bulletin board on one end, in each room. Some teachers used one chalk board for writing and the other for displaying posters and student work. The 4-foot-high, light brown paneling around the room was also used to display completed student assignments, teacher made materials, and commercial-type educational decorations.

Each room was heated by two steam radiators. Teachers stated that they were rather difficult to keep regulated in the afternoons. One side of the room was too hot and the other side of the room was too cold. It was observed that some rooms were too hot and the teacher had a couple of windows cracked to regulate the heat.

A coat closet (original 1930s) was built into each room. This type closet has two doors on each end for ingress or egress. The coat closet is a narrow (5 feet wide) area that extends almost across the end of the room. Coat hooks are along one side to hang outer garments. The teachers only leave enough room for students to hang their garments and the rest is taken up for storage. Teachers almost unanimously stated that more storage area was needed. Teacher desk area ranged from 36 to 64 square feet. Most of the teachers desk areas were observed to contain stacks of workbooks, boxes of manipulatives, and a myriad of reference materials.

Student desks (except kindergarten) had plastic seats, metal legs, and a wood top measuring 18 inches by 24 inches. The desks were constructed in one piece with a wire holder under the seat to hold books and other materials. The wires are spaced approximately 2 inches apart, therefore, children lose pencils, crayons, and small items from the desk. There is no slot for a pencil in the desk top. The desks were lightweight and easy to tip over. During one observation period a child was observed to fall forward when leaning over and placing weight on the desk while writing; this occurred twice in one period. One teacher stated:

> I believe in quality instead of quantity when you are buying furniture. They need to ask the teachers what they need instead of buying something like these desks.

Kindergarten

The kindergarten room observed in the study was located in a portable unit to the rear of the main building near the high school science building. The concrete blocks on which the building sat were hidden by attractive underpinning materials. The building measured 30 feet by 65 feet and housed two classrooms. Each of the classrooms were the same size. One room housed a kindergarten class and the other a sixth grade class. Covered steps were at the entrance to each classroom located at opposite ends of the building. The wooden steps led up to a small platform (porch) at the entrance. The porch and steps were constructed with treated lumber. The teacher and the aide stated that they became slick when wet and some of the children had slipped and fallen before they could be caught. The teacher stated that the kindergarten class was assigned to the portable classroom because a handicapped child was a member of the class and there was no way a wheelchair could get up and down the steep stairs in the main building. An aide was assigned to assist the handicapped child. There was a wooden ramp constructed to provide access to the rear door entrance and exit of the handicapped child. Figure 4.3 shows the spatial organization.

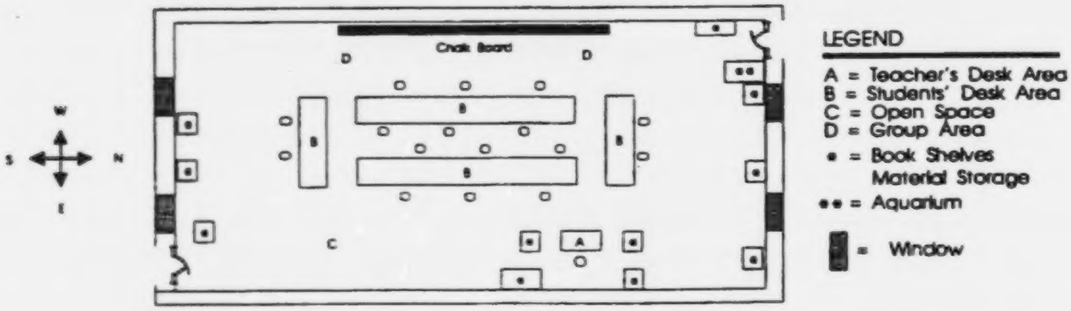
W
S
N
E
Chalk Board
D
D
B
B
B
B
C
A
LEGEND
A = Teacher's Desk Area
B = Students' Desk Area
C = Open Space
D = Group Area
• = Book Shelves Material Storage
•• = Aquarium
= Window

Figure 4.3. Kindergarten room at Belgreen School. (Graphic representation is not to scale.)

Lighting in the classroom was excellent. There were no distracting shadows or glare on student work areas. Seventeen students were in the kindergarten class. The floor had brown carpet that was in good condition; however, the teacher stated she disliked carpet and would prefer tile. The teacher continued by remarking that tile was easier to clean and more sanitary. The teacher was asked if she had a custodian to clean her room would she still prefer tile? The teacher answered, "Yes, because it is more

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sanitary, the children do have accidents, and the carpet holds germs." Every teacher that was asked her preference replied they preferred tile floors.

There were many examples of student work on display. One large bulletin board behind the teacher's desk was covered with student drawings and cutouts. Other teacher-made and commercial drawings, posters, and letters of the alphabet were placed on the walls around the room. The room appeared to be well-organized. The students' work area consisted of two 8-foot and two 6-foot adjustable tables. The tables were set up in a square with the longest tables on each side and the shorter tables at each end. A space was left large enough at each corner for a child to pass through to the inside of the square. When free time was allowed a couple of children enjoyed sitting on the floor, inside the square, to work.

Once weekly a parent came to read a story to the children. The children sat on the floor around the reader, and displayed a great deal of enthusiasm during the reading period. When interviewing the librarian, on tape, she made the following comment:

> Children just love to be read to. If you want to turn them off just put a tape on the VCR and I guarantee they won't like it.

Books were checked by the researcher in the elementary classrooms and the library to ascertain if they contained multi-cultural material. From observation and investigation, the three schools, Belgreen, Red Bay, and Vina, teach multi-cultural concepts and have school books, library books, and materials for a good ongoing program.

The open space area, Area C, was ample in size, measuring approximately 206 square feet. This area was used by parents and the teacher for reading, story telling, games, and role playing. Two small areas were enclosed by homemade bookcases. One bookcase held various toys, including building blocks, assembly wheels, and other play things. One or two children could get into this area if they wanted privacy. The other two bookcases had a rod extending from one bookcase to the other for the children to hang their coats on. There was no other provision for hanging or storing clothing. The bookcases on the opposite side had removable baskets for children to store their supplies. Another homemade bookcase to the rear of the teacher's desk contained various materials with full baskets and boxes located underneath, on the floor. Sleeping mats were neatly folded and stacked on the floor near the wall. One learning center contained an Apple computer with a table and two chairs. Four other learning centers contained various materials for work.

The chalkboard was green and located on the west wall with additional commercial type ABC's displayed above the board. The room had central air and heating and was quite comfortable. The kindergarten appeared to have four negative impacts on the learning climate:

1. The kindergarten room located in the portable building had no restroom. Children must travel approximately 65 yards to use the high school restroom located in the science building. The teacher and aide were not pleased with this arrangement. They stressed that although children were sent to the restroom in pairs, it still was a bad situation.
2. The porch and steps were slick when wet.
3. There was no water fountain except in the high school science building.
4. The roof of the portable was metal. High winds caused a loud sharp cracking sound on the roof. Some of the children appeared nervous and the teacher stated that she had to take one little boy outside and show him what was causing the noise before he would settle down to work.

The research could hear no other noises from the other room or the outside (except when the wind was blowing). The carpet helped to muffle sounds and the acoustics were such that the teacher could be heard well in all areas of the room. When students were working in the open space, Area C, they did not disturb students in the small group area, Area

D or in Area B, which was the table and chair area. Although the furniture was not matched, it was adequate.

The observation period to determine spatial utilization for kindergarten consumed 40 minutes. During the 40 minute observation, the teacher's desk area, Area A, was not utilized by any of the students. At the beginning of the period the teacher assigned students individual projects (freedom of choice). The majority of the students initiated their work in the small group area, Area D, where learning centers were located. Most students selected materials related to their work. The children had settled down to their area of choice by 2:02 p.m. Fifty-three percent chose student desk area, Area B; 35% chose to work in Area C, the open space area; and 12% chose Area D, the small group area. A small number of migrations began between Area B, the student desk area; Area C, the open classroom area; and Area D, the small group area. The majority of these migrations consisted of children going over to another child to seek help or show what they were doing. These movements indicated the occurrence of thought and work. There was no loud talk or play. The teacher and aide (when she was not occupied with the handicapped child) migrated to where they were needed.

The teacher changed the instructional program at 2:20 p.m. and had the children draw Plymouth Rock and the surrounding water scene (from a previous lesson). All students except one had returned to their assigned tables, Area B, by 2:20 p.m. When instruction was completed most of the children (94%-74%) preferred to complete the activity (drawing), from their tables and as a result remained in Area B. Area D, the small group area, was not used until 2:28 p.m. when one child occupied it for four minutes. Except for four minutes, Area B, the student desk area, and Area C, the open area, were the only areas occupied. During the period 2:20 p.m. to 2:40 p.m. Area C, the open area, had from one to four students during two-minute intervals. Area B, the student desk area, had from 13 to 16 students in the same period.

The aggregate space utilization for students in kindergarten that was computed utilizing the method explained on pages 105-106, was as follows:

Area A -- 0% space usage
Area B -- 67% space usage
Area C -- 22% space usage
Area D -- 11% space usage

Area B, which was the student desk area of the classroom, was utilized the greatest amount of time by students while Area A, the teacher's desk area, was utilized the least amount of time. There was a total of 17 students assigned to this kindergarten class.

TABLE 4.1

Classroom Spatial Utilization of Kindergarten Students and Teachers In Belgreen Elementary School (Two-Minute Intervals)

Teacher	C	B	B	B	B	B	B	B	D	D	D	B	B	B	B	C	C	B	B	B	A					
Aide	B	C	C	D	D	B	C	C	B	B	B	B	B	B	B	B	B	C	A	A	C					
Students																										
23																										
22																										
21																										
20																										
19																										
18																										
17																										
16												B									B					
15													B	B												
14															B	B	B	B								
13	D																		B	B						
12																										
11																										
10				B	B	B																				
9		B	B				B	B	B	B	B															
8																										
7																										
6		C					C																			
5			C	C	C	C		C	C	C	C															
4																			C	C						
3	C		D					D	D	D	D						C	C								
2		D		D	D	D	D						C	C	C	C										
1	B											C			D	D					C					
Time Intervals	2	02	[illegible]	06	08	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40					
C/A Area	Classroom Area Percentage of Use Over Time																									
A																										
B	6	53	53	59	59	59	53	53	53	53	53	94	88	88	82	82	82	82	76	76	94					
C	18	35	29	29	29	29	35	29	29	29	29	6	12	12	12	12	18	18	24	24	6					
D	76	12	18	12	12	12	12	18	18	18	18				6	6										

Aggregate % of Area Use	Refined Aggregate % of Area Use
1398%	67%
464%	22%
238%	11%

	AREA PERCENTAGE OF C/R By One or More Students *
A = Teacher's Desk Area	A = 0%
B = Student Desk Area	B = 100%
C = Open Area	C = 100%
D = Group Area	D = 62%

* = Time of observation period that specific spaces were utilized.

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First Grade

The first-grade class observed in the study was located in room number nine of the main building. Figure 4.4 shows the spatial organization of the classroom.

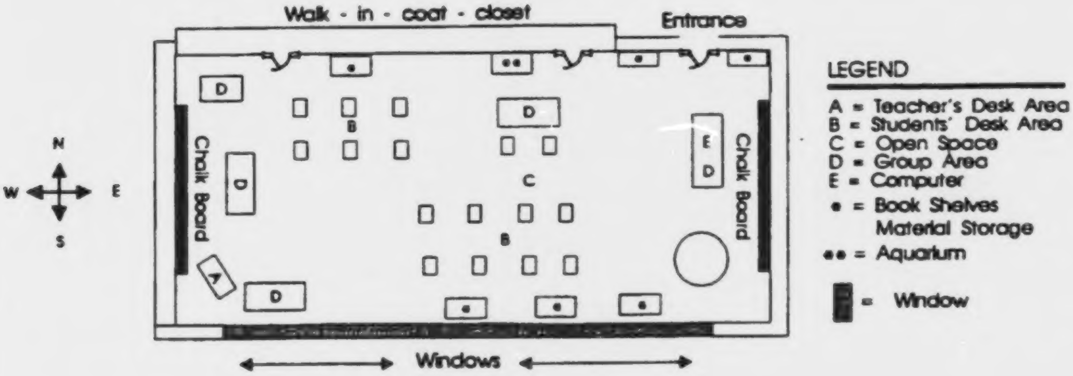
Walk - in - coat - closet
Entrance
N
W
E
S
Chalk Board
Chalk Board
A
B
B
C
D
D
D
D
D
E
Windows
LEGEND
A = Teacher's Desk Area
B = Students' Desk Area
C = Open Space
D = Group Area
E = Computer
• = Book Shelves Material Storage
•• = Aquarium
= Window

Figure 4.4. First grade classroom at Belgreen School. (Graphic representation is not to scale.)

The first grade room consisted of one teacher and 16 students. The classroom measured 660 square feet, the same footage as all elementary rooms in the primary grades except for the one kindergarten class that was in the portable building. There were five windows on the south side of the room, all in working order, measuring 2-1/2 feet wide and 6 feet high (double windows 2-1/2' x 3'). All windows were equipped with workable window shades. A room air conditioner was located in one window. During an interview, the teacher stated the air conditioner was very quiet and did not disturb the children. With permission of the teacher the researcher turned the air conditioner on during a recess period, and indeed, it produced a soft hum not loud

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enough to be a problem. The ceiling was lowered to 9 feet and made of white acoustic panels with 11 two-bulb fluorescent lights placed flush with the ceiling. The lighting was excellent. The floor was a light gray tile (the same throughout the building). The walls (same through the building) were painted a light cream color down to the 4 foot paneling which was painted a light brown. A few teachers complained (off the record) that the color scheme had become monotonous because the same color existed throughout the building.

Upon entering the first-grade classroom, the researcher's attention was immediately focused on examples of students' work and teacher-made materials. These materials were hanging on strings from the ceiling, on all four walls, one of the chalkboards, three of the five tables in the room, and on the lower windows. There was an aquarium, student storage boxes, seven bookcases or shelves, a homemade rocket ship, two steam radiators, and 16 student desks in the room. The room appeared to be crowded.

The teacher had to squeeze between two tables to reach her desk area. There was more room to walk behind her desk to gain access to the tables than if she attempted to gain access by walking to the front of the desk. The teacher's desk area, Area A, consisted of 34 square feet. The coat room had two doors at each end; however, one door was blocked from the inside with homemade shelves. This room was converted into a storage room for art materials including paints, brushes, gloves, aprons, and other materials such as books, magazines, various kinds of paper, and various other materials. The children hung their coats on the back of their desks.

The desks were lightweight, made of a wood top, plastic seats with small metal legs, and a wire basket-type container under the seat for storage; however, the wire container was the type that did not secure pencils, crayons, and small items. There was no pencil slot in the desk top, which measured 18 inches by 24 inches. When children leaned on the front of the desk, it would fall forward. This type desk was used from first grade through sixth grade. One teacher stated:

> I hate these desks, it is not fair to the children who have to use them. It keeps me scared that one of my children will get hurt falling over.

When asked the question, what preference she had, carpet or tile, the teacher replied:

> I'd rather have tile. It's easier to keep clean. You know the teacher has to clean their room. I would not mind if I had the room to have about a 12 foot by 12 foot carpet for the children to sit on for reading class or group activities.

The only open space was down the center aisle, between the desk, on each side of the room.

The chairs that were used to accommodate children for work at the tables, aquarium, and computer were old and did not match; however, they were adequate. The teacher stated that when the new desks arrived, she took one look at them and decided to keep her old tables and chairs. The teacher further stated that she allowed the children to use the tables as much as they used the desks. The lighting was excellent; there was no glare visible in the room. The room was rather warm and the teacher had two windows opened about three inches for air circulation.

Noise coming from the elementary gym caused the teacher to close the door. With the door closed one could hear children coming up the stairs, going to the restroom, stopping at the water fountain, and (in file or group) walking to the old gym. During the observation inclement weather prevailed and hallway traffic was heavy. Elementary children were using the gym for play. The researcher noted that an observation should take place in the first grade room during the high-school recess. The noise level was very high during high-school recess. Similar noise levels were noted during the play period for elementary students.

The teacher assigned all students to Area B while giving instructions at 11:45 a.m. Six of the children had been out of school with the flu and were to work on assignments which they had not completed. The other students were assigned art work. The children began their assignments at 11:47 a.m. Table 4.2 provides a graphic illustration of the spatial utilization pattern of students and the teacher.

TABLE 4.2

Classroom Spatial Utilization of First Grade Students and Teacher In Belgreen Elementary School (Two-Minute Intervals)

Teacher	A	D	D	C	B	B	D	D	C	D	D	D	B	C	C	D	D	B	C	A	A					
Aide																										
Students																										
23																										
22																										
21																										
20																										
19																										
18																										
17																										
16	B																				B					
15																				B						
14																										
13																										
12																										
11																										
10		D																								
9						D							D													
8			D	D	D				D	D	D	D		D			D	D	D							
7							D	D							D	D										
6												C		C	C	C	C									
5			B	B	B		C	C	C	C	C		C					C	C							
4		B				B	B	B																		
3			C	C	C	C			B	B	B				B	B		B	B							
2		C										B	B	B			B									
1																				D						
Time Intervals	11	47	49	51	53	55	57	59	12	03	05	07	09	11	13	15	17	19	21	23	25					
C/A Area	Classroom Area Percentage of Use Over Time																									
A																										
B	100	25	31	31	31	25	25	25	19	19	19	12	12	12	19	19	12	19	19	94	100					
C	0	12	19	19	19	19	31	31	31	31	31	38	31	38	38	38	38	31	31	0	0					
D	0	63	50	50	50	56	44	44	50	50	50	50	56	50	44	44	50	50	50	6	0					

	Aggregate % of Area Use	Refined Aggregate % of Area Use
A		
B	668%	32%
C	532%	25%
D	901%	43%

	AREA PERCENTAGE OF C/R By One or More Students *
A = Teacher's Desk Area	A = 0%
B = Student Desk Area	B = 100%
C = Open Area	C = 90%
D = Group Area	D = 95%

* = Time of observation period that specific spaces were utilized.

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The observation period to determine spatial utilization for first grade consumed 40 minutes. After reviewing assignments, students disbursed using Area B, the student desk area, Area C, the classroom open area, and Area D, the group area. The teacher migrated to areas where needed; she did not return to her desk until the end of the period. The children did not migrate to Area A, the teacher's desk area, for the entire period.

The teacher had difficulty, at times, getting around desks, children lying on the floor, and crowded tables. Area D, the group area, was utilized by seven to ten students for the majority of the period. Area C, the open area, was used by two to six students, and Area B, the student desk area, was used by two to five students from 11:47 a.m. to 12:21 p.m., the majority of the period. The teacher had all students return to Area B at 12:23 p.m. The class ended at 12:25 p.m.

The percentage of time that specific spaces were utilized during the observation were as follows:

Area A, Teacher Desk Area	0%
Area B, Student Desk Area	100%
Area C, Open Area	90%
Area D, Group Area	95%

The aggregate space utilization for students in the first grade that was computed utilizing the methods explained earlier was as follows:

Area A	0%	space usage
Area B	32%	space usage
Area C	25%	space usage
Area D	43%	space usage

Area D, which was the group area in the classroom, was utilized the greatest extent by students while Area A, the teacher's desk area, was utilized the least.

The teacher made the following comment during an interview after the observation period:

> I know my room appears cluttered with so many shelves full of materials, and students work all over the place, but I try and individualize to the child's needs and this takes additional books and materials. I appreciate the renovation and what our principal has done, but when you renovate an old building you can do just so much. It's still an old design and we need more space and the right furniture. Central air and heat would be nice.

The teacher was asked about the library and auditorium being separated from the main building and how this affected the learning climate. The teacher replied that in nice weather it was not so bad because they only went to the library one period a week; however, during inclement weather it presented a problem. She also commented that the problem is worse when there is a need to gain access to the auditorium because there was no covered walkway connecting the two structures. She added, "too much time is wasted putting on and taking off outer garments, in addition to the walk." When asked about the homemade rocket model in her room, she replied that her husband had built it along with most of the bookcases and shelves. The rocket could hold two students. The teacher used this device as a reward for students who successfully completed work on time and for those who exhibited good behavior. When asked about the steam radiator heat, the teacher stated, "All these years I've had this type heat, and I don't know of anyone who can successfully regulate the temperature." She further explained that in the afternoons, when the weather moderates and if children were in the gym or using the halls, the door must be closed to prevent noise. The only recourse to provide proper ventilation was to open windows.

Second Grade

The second-grade section chosen for the observation was located in room number seven. Located on the northwest front of the building, the room had the same features as the first grade room: 660 square feet, two steam radiators for heat, window air-conditioning, floor tile, walls with 4 foot paneling that was painted the same, coat closet, five 3 foot by 6 foot windows, and a 9 foot lowered ceiling with 11 flushed fluorescent lights. Figure 4.5 presents a graphic illustration of the classroom spatial utilization by students and teacher.

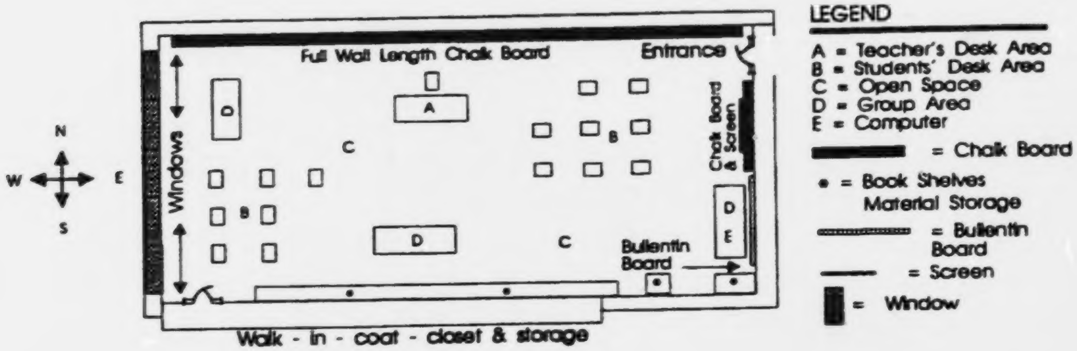
N
W
E
S
Full Wall Length Chalk Board
Entrance
Windows
A
B
C
D
D
B
C
C
Chalk Board & Screen
D
E
Bulletin Board
Walk - in - coat - closet & storage
LEGEND
A = Teacher's Desk Area
B = Students' Desk Area
C = Open Space
D = Group Area
E = Computer
= Chalk Board
• = Book Shelves Material Storage
= Bulletin Board
= Screen
= Window

Figure 4.5. Second grade classroom at Belgreen School. (Graphic representation is not to scale.)

Upon entering the room the first thing observed were the windows on the west side. The window shades were pulled down about one fourth of the way to keep out the sun's glare. It was a bright, cold February day. Although the large oak trees in front of the school kept most of the sunlight out, there was enough to cause a glare; although the shades helped, by the time the researcher left the room at approximately 2:15 p.m. the shades had been pulled down and the glare was still quite evident. The teacher stated the glare was not a problem, that most of the classes upon which the glare would impact negatively were conducted during the morning hours.

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There was a brown chalkboard across the entire north wall with the alphabet and numbers above the top border. Another smaller chalkboard with projector screen above it and a rather large bulletin board on the side was on the east wall. A coat closet with one door sealed off was on the south wall. There was a homemade bookcase located in front of the closet. The bookcase extended from a point near the door of the closet to approximately 18 feet. The bookcase was filled with children's books and materials. The coat closet, 45 square feet, was used for hanging outer garments and/or storing materials. The room contained two 8-foot tables and 16 chairs. The teacher's desk area (Area A) measured 64 square feet. Area C, the open area, was larger in this room due to less furniture and learning centers. A computer sat on a small table with room enough for two students.

Childrens' work was attached to the windows and was visible when approaching the building from the outside. Childrens' work in the first and second grades was observed in the hallway outside their doors. Their work was affixed to the wall paneling in the hallway and also inside the classroom. The students' desks were lined up, eight on one side of the room and seven on the other side of the room. The desk arrangement caused all students to face each other. All the desks were the same as the ones described in grade one. The teacher stated that children also had problems with their desks tipping over. All desks were for right-handed students and they could not be pushed together to form a work area because the writing area slanted upwards from the seat. Teacher and student movement between desks and other areas of the room did not impose a problem.

The room was located across the hall from the gym. The teacher verified what other teachers had stated about the noise. She stated that during certain periods the noise was unbearable. She also stated that it would be nice if elementary students had another gym located away from the classrooms. She stated that if the windows were up during spring or fall and high school students were on break, the noise outside was so distracting that the windows had to be closed, thus causing a need for the air-conditioner. The teacher also commented on the restrooms. She stated, "I would love to have a restroom in each room and a sink with water, it cuts down on problems." When asked what type floor covering she preferred the teacher quickly replied, "tile floor." She agreed that carpet would help with noise but it would be too hard to clean after the children had art, science experiments, or drawing.

TABLE 4.3

Classroom Spatial Utilization of Second Grade Students and Teacher in Belgreen Elementary School (Two-Minute Intervals)

Teacher	A	D	D	C	A	A	D	B	C	C	D	D	D	D	C	C	C	D	B	B
Aide																				
Students																				
23																				
22																				
21																				
20																				
19																				
18																				
17																				
16																				
15																				
14	B																			
13																				
12																				
11																				
10																				
9																				
8													C	C	C					
7				C	C	D	D	D	D	C	C	C				C	C	D	D	D
6		C	C				C	C	C					D	D	D	D			
5		D	D	D	D					D	D	D						C	C	C
4		B	B			B							D							
3				B		C				B	B	B							B	B
2					B		B	B	B				B			B	B	B		
1	C				A	A							A	B	B			A		
Time Intervals	1	02	04	06	08	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38
C/A Area	Classroom Area Percentage of Use Over Time																			
A					7	7							7					7		
B	93	27	27	20	13	27	13	13	13	20	20	20	13	7	7	13	13	13	20	20
C	7	40	40	47	47	20	40	40	40	47	47	47	53	53	53	47	47	33	33	33
D	0	33	33	33	33	47	47	47	47	33	33	33	27	40	40	40	40	47	47	47

Aggregate % of Area Use	Refined Aggregate % of Area Use
28%	1%
412%	21%
814%	41%
747%	37%

A = Teacher's Desk Area
B = Student Desk Area
C = Open Area
D = Group Area

AREA PERCENTAGE OF C/R By One or More Students *
A = 21%
B = 100%
C = 100%
D = 95%

* = Time of observation period that specific spaces were utilized.

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The observation period to determine spatial utilization for the second grade consumed 40 minutes. During the 40 minute observation, the teacher's desk area, Area A, was occupied for eight minutes by one or more students. This use by students represents a 21% time equivalent of use for Area A. Area B, the student desk area, was occupied by one or more students for the entire 40 minutes. This represents occupying Area B, by one or more students, for 100% of the observation period. Area C, the open area, was occupied by one or more students during the entire 40-minute period. This means that Area C was occupied 100% of the 40 minute observation period. More students utilized Area C than any other area of the classroom (see Table 4.3). Area D, the group activity area, was utilized by four to seven students for a total of 36 minutes of the 40-minute class period. This area was utilized by one or more students for 95% of the time of the observation period.

The aggregate space utilization for students in the second grade, which was computed utilizing the method explained earlier was as follows:

Area A	1%	space usage
Area B	21%	space usage
Area C	41%	space usage
Area D	37%	space usage

Area C, which was the open area of the classroom, was utilized to the greatest extent by students, while Area A, the teacher's desk area, was utilized the least.

At 1:00 p.m. the teacher gave instructions for the different reading levels to get their books and divide into groups. There were six groups on two reading levels. Student divided into three groups of three and three groups of two (15 students). The students were given freedom of movement at 1:02 p.m. Most of the student groups moved to Areas C and D. Two to four students remained at their desks, moving them closer together. The teacher migrated to areas where she was needed. The students read to each other during this time. Two students approached Area A, and the teacher greeted them and responded to their questions (1:08 and 1:10 p.m.). At 1:24 p.m. the teacher began to call one student from each group to read aloud from a page in the assigned text. This activity continued until 1:38 p.m. The music teacher then entered the room and stated she could take the children at this time. The class ended at 1:38 p.m.

Exterior Observations and Maintainability

The playground is approximately 300 yards from the main school building. It is located below a rather steep hill; however, a new uncovered sidewalk has been constructed which leads to the playground. The sidewalk has helped the children gain access to the playground under safer conditions. The playground area is adequate to accommodate all students. There was a six-foot, chain-link fence around the playground that was in excellent condition. The playground had five sets of swings, for a total of 24 swings, one slide, a set of climbing bars, an obstacle ladder, one upper and one lower maze, a balancing walk, and two comfortable benches.

A large pea-gravel area had been constructed under and around the slide. This was the favorite place of play for the children. The teachers stated that playing in the pea gravel was the favorite activity for all primary grades. The second most popular playground item for the children was the swings. The teachers supervised the children by pushing the swings and interacting in a very helpful manner. Only one child was observed on the maze. Occasionally a couple of children would walk on the balancing walk. No children were observed using the obstacle ladder. There were no protective landing areas beneath the other playground equipment.

The elementary teachers appeared to be quite proud of their playground. In a taped interview one teacher stated:

> Oh, listen, Mr. Britton got out there with a bunch of daddies and they literally built that playground out of a side of a hill. They had to level that sucker up, one of the daddies brought his bulldozer down and did that for free. The men of the community put that fence up too; they really worked on that playground.

There was a wooded slope between the end of the sidewalk and the first pieces of equipment on the playground. This slope extended to the end of the fence. The teachers stated that they had to observe the children carefully because some children attempted to leave the play area and run into the woods. Two kindergarten classes consisting of 34 children and two teachers were observed on the playground.

Belgreen school has one custodian for grades K-12. The teachers are responsible for cleaning their classrooms. The custodian is responsible for cleaning the hallways, restrooms, and outside areas. This includes mowing the grass and trimming the shrubbery. There appears to be a good rapport among the teachers, students, and custodian. The custodian stated that he tried to keep the school and grounds clean. He remarked that students did not litter. He further stated, "the teachers and principal are always telling the students not to throw things down." One teacher stated on tape, "If you keep your school clean and the grounds clean the children will notice and will help." The custodian said that vandalism was not a problem even though the school was in a rural area. When asked how hard the maintainability of the building was, he replied that according to other custodians and Franklin County school maintenance personnel, Belgreen school was no worse than the other schools. He further stated:

> I have to keep ahead of things, especially in the spring and when school starts. You have to cut grass and do a lot of trimming. I don't mind the work for I like the principal and the other people, teachers, and lunchroom workers. I like the office ladies too.

Although the observation periods occurred during the winter months, the grass appeared to have been well taken care of and the shrubbery was neatly trimmed. All painting and major repairs to the building were done by Franklin County School System maintenance personnel. While the study was in progress, a private contractor installed an outside plastic cover over all the exposed wood on the library (part of this work was captured on video tape). County maintenance personnel were observed working on the heating system at Belgreen school. Workers were asked if the older building presented additional maintenance problems. They verified what the custodian stated, by remarking that it gave no more problems than the other schools in the county since it was renovated in 1984. One maintenance man pointed out that the renovation included new wiring, plumbing and steam pipes, windows, floors, walls, roof, ceiling, lighting, chalkboards, some furniture, "just about everything but the shell." The building appeared to be in excellent condition. There were no roof leaks, broken windows, or broken water pipes observed.

Perceptions

Users' Perceptions

Perceptions of the teachers, administrators, and support personnel concerning the facility and learning climate were collected through the use of interviews, general conversations, and the Teacher's Educational Facility Perception Questionnaire.

The building principal related to the researcher in a general conversation that the building was completely renovated in 1984. He further stated that improvements had been made primarily in the interior of the building, and that there was great improvement in the structure. The principal, during a taped interview, expressed his desire for a new elementary gym. His primary concern was that the noise which emanated from the gymnasium disturbed classes. He also expressed a desire for more covered walkways to the auditorium, music room, playground, and gym. The principal was asked about the kindergarten class in the portable building. He replied that this was not a desirable situation and continued by stating that the main building was not constructed to accommodate handicapped persons. He informed the researcher that the narrow steep stairways to the lunchroom and to the exit would not accommodate a ramp unless one classroom over the stairs was torn out and three classrooms along side and under the stairs were blocked off. "We are so short of classrooms," the principal said that, "I felt at the time, I had no other choice but to put the handicapped child in the portable building." The handicapped child was assigned an aide, on an individual basis, that attended to her needs. It was learned by the researcher that the aide holds a bachelor's degree in early childhood education. The aide stated that this activity provided her with experience while she waited for employment as a teacher.

The noise level from the stairs, the hallway, water-fountain area, restrooms, and elementary gym was a concern of all of the elementary teachers located in the main building. A teacher was asked if the teachers' lounge was convenient for socializing. She replied, "We just don't have time to use it." At no time during observations at Belgreen school were elementary teachers observed visiting in the lounge.

The researcher posed the following question to teachers, administrators, and support personnel: "What would you do for your school if you had unlimited funds?" One typical answer was, "If I had unlimited funds, I would build a new elementary school. I would designate this building as the high school, it's still a good building, but we need more space between high school and elementary." Another teacher stated that "The first thing I would do is build an elementary gym, to cut down on the noise." Several teachers stated that they would "get more computers" or "would build a computer room." Another answer was "cover all the walkways." The distance children had to walk to gain access to the playground and the music room also concerned administrators and teachers. The music room had no covered walk. The custodian stated, "If I had all the money I need, I'd hire more help, plant more flowers, and build more classrooms." The secretary stated, "I need more room." One lunchroom worker stated, "With all the money I needed, I would enlarge the dining room and build more storage."

Teachers' Perceptions

The Teacher's Educational Facility Perception Questionnaire was provided to each teacher in the Belgreen Elementary School. They were asked to identify their perceptions about the Belgreen School for providing an effective learning climate based on the following standards:

a. Illumination
b. Noise
c. Color
d. Thermal Environment
e. Space
f. Location
g. Maintenance
h. Esthetics
i. Safety

Teachers responded to each of the 26 statements, which relate to a standard that facilities should meet in order to present an effective learning climate. Teachers were asked to think carefully about the Belgreen Elementary facility and relate their response to whether Belgreen Elementary met the standards of providing an effective learning climate. Possible responses were "Yes," "No," and "Somewhat."

Table 4.4 provides a composite of the results from the questionnaire.

TABLE 4.4

Composite Results of the Teacher's Educational Facility Perception Questionnaire at Belgreen Elementary School

STATEMENTS OF EFFECTIVE SCHOOL LEARNING CLIMATES	RESPONSES TO		
	YES	NO	SOMEWHAT
1. The exterior of a school should be pleasing in appearance.	9	0	3
2. The school facility contributes to the positive and negative attitude of teachers.	8	0	4
3. The facility allows for flexibility in teaching.	7	0	5
4. The facility contributes to a desire to continue teaching in the building.	5	0	7
5. The building and grounds provide a safe environment for students and teachers.	7	1	4
6. Large classroom size facilitates effective teaching.	4	4	4
7. The classroom promotes positive social interaction among students.	9	0	3
8. The classroom size allows for a wide variety of learning and teaching styles.	4	4	4
9. Classroom size restricts the movements of students and teachers.	5	2	5
10. Classroom size fosters a variety of teaching methodologies.	3	4	5
11. The organization and arrangement of the classroom fosters pride in students and parents.	7	0	5
12. The teacher maintains adequate control of the classroom physical environment.	10	2	0
13. The classroom accommodates the individuality of the student.	5	0	7
14. The classroom has ample storage areas for teacher materials.	5	4	3
15. Classroom storage areas do not occupy needed instructional space.	4	6	2
16. Classroom storage is used only for storing instructional materials.	8	3	1
17. Flexible walls and movable partitions enhance the effectiveness of instructional space.	1	11	0
18. Good school locations positively affect learning climate.	10	1	1
19. Well maintained school facilities promote positive learning environments.	9	2	1
20. The facility enhances the teacher's ability to perform in accordance with the goals and objectives of the district.	6	1	5
21. Illumination (lighting) provides for adequate visual environment in the classroom.	12	0	0
22. Proper acoustics prevail thereby eliminating unnecessary noise.	2	6	4
23. Classrooms are located in areas which insure the elimination of noise which could contribute to an unpleasant climate.	1	8	3
24. Color schemes enhance the esthetics of the building.	4	5	3
25. The thermal environment contributes to the maximum comfort of students.	5	3	4
26. The building and grounds have a pleasant appearance which is esthetically pleasing.	7	0	5
TOTALS	157	67	81
PERCENTAGES	51%	22%	27%

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The response of teachers relative to their facility's provisions of conditions leading to an effective learning climate were as follows.

Illumination. Teachers' responses to the statement, "Illumination provides for an adequate visual environment in the classroom," showed that they felt that their school provided adequate illumination to offer an effective learning climate. One hundred percent responded "Yes," 0% responded "No," and 0% responded "Somewhat" to item 21 on the questionnaire.

Noise. The statement which read, "Classrooms are located in areas that insure the elimination of noise that could contribute to an unpleasant climate," received a negative response. A majority of teachers responding did not agree that the Belgreen School provided adequate noise prevention to meet a standard for providing an effective learning climate. Only 8% responded "Yes," while 67% responded "No" and 25% responded "Somewhat" to this item (Item 23).

Color. The statement which read, "Color schemes enhance the esthetics of the building," received a negative response. A total of 42% of the teachers responded "No" to this item as they expressed their perceptions about the Belgreen School. Thirty-three percent of the teachers felt that color schemes would provide for an effective school climate while 25% of the teachers felt that "Somewhat" was the appropriate response.

Thermal Environment. The statement, "The thermal environment contributes to the maximum comfort of students," received a positive response. Forty-two percent of the teachers responded that the thermal environment at the Belgreen School contributed to an effective learning climate. Twenty-five percent responded "No" and 33% responded "Somewhat" (Item 25).

Space. There were five items on the questionnaire that pertained to space in the classroom. These items were 6, 8, 9, 10, and 13. Teachers differed in their responses to these items. An analysis of each item revealed that 35% of the responses regarding all five items indicated that the Belgreen School offers adequate space to provide for an effective learning climate. Twenty-three percent felt that the facility did not provide adequately, and 33% responded by using "Somewhat."

Location. Teachers' responses to the statement, "Good school location positively affects the learning climate," showed that a majority of the teachers (83%) perceived that the location of the school positively affected the learning climate at Belgreen. Only 8% of the teachers responded "No" to this statement and 8% responded by using "Somewhat."

Maintenance. The statement, "Well maintained school facilities promote positive learning environments," received a positive response. Seventy-five percent of teachers responded "Yes" that the maintenance contributed to an effective learning climate, while 17% responded "No," and 8% responded "Somewhat."

Esthetics. The statement, "The building and grounds have a pleasant appearance that is esthetically pleasing," received a positive reaction regarding an effective learning climate at Belgreen. Fifty-eight percent responded "Yes," 0% responded "No," and 42% responded "Somewhat."

Safety. Teachers' responses to the statement, "The building and grounds provide a safe environment for students and teachers," showed that a majority of teachers responded positively regarding Belgreen School and its provision for safe conditions that contribute to an effective learning climate. Fifty-eight percent of the teachers responded "Yes" to this statement. Eight percent responded "No" while 33% responded "Somewhat."

Teachers in Belgreen Elementary School indicated by marking the "Yes" column on the perception questionnaire that their school "measured up" to the characteristics of an effective school on 157 out of a possible 305 response options for a composite of 51% "Yes." The "No" column, indicating that teachers perceive that Belgreen Elementary did not "measure up" to the standards of an effective school received 67 out of a possible 305 response options for a total of 22%. The "Somewhat" column received 81 responses from teachers who perceived that Belgreen Elementary School "measured up" in some degree to the effective schools, but not in all aspects. This accounted for 27% of the possible 305 response options. Characteristics receiving the most positive responses from teachers were Number 1: The exterior of a school should be pleasing in appearance; Number 2: Facilities contribute to the attitude of teachers; Number 7: Classrooms promote positive social interaction among students; and Number 16: Classroom storage is used only for storing instructional materials. Characteristics receiving negative reaction from teachers were Number 15: Classroom storage does not occupy needed instructional space and Number 17: Flexible walls enhance the effectiveness of instructional space. Most responses in the "Somewhat" category were Number 14: The teachers desire to continue teaching in the building and Number 13: The classroom accommodates the individuality of the student.

At the conclusion of the study, the researcher met with the principal of Belgreen Elementary School. In addition to a taped interview, a general overview of the study was presented for his information and verification. The meeting was the final member checking session between the principal and the researcher. The principal indicated his interest in the study by requesting a copy of the final results.

Summary

Several aspects of the Belgreen Elementary School seem to have a major impact upon the learning climate in the school. The renovation of the school in 1984 appeared to enhance the learning climate of the school. The illumination tended to foster a positive learning environment as well. The esthetic appearance when approaching the building seemed to enhance the learning climate.

The noise level from the interior of the school appears to have a negative impact. Noise was generated from children using the stairs, walking in the hallway, using the water fountains, using the restrooms, playing in the elementary gym (especially during inclement weather), and during snack time in the elementary gym by both high school and elementary students. The bus loading zone and parent pickup zones were so close that congestion occurred. The location of the loading zone negatively impacts the learning climate. Highway 187 runs through the campus close to the bus loading and unloading zones. This appeared to have had a negative impact on the learning climate. More covered walkways were observed to be needed, especially to the auditorium and music room. This problem appeared to have a negative impact on the learning climate.

The Belgreen Elementary facility appeared to enhance the overall learning climate of the school.

Red Bay Elementary School

Setting (General Observations)

The Red Bay Elementary School is a school in the Franklin County School District. The school is located on the southeast side of the city of Red Bay, Alabama. The 35-acre school plot is surrounded by a pleasant, well-kept neighborhood. Red Bay Elementary school houses 521 students, 27 teachers, and one aide. During a conversation with the principal, he stated, "The ethnic breakdown is 2% black, 1% Hispanic, and 97% white. Figure 4.6 provides a photograph of Red Bay Elementary School.

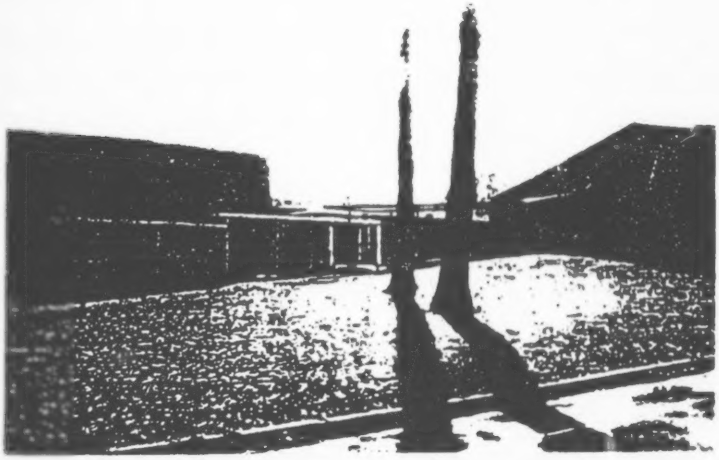

Figure 4.6. Photograph of Red Bay Elementary School

Surrounding Area

Red Bay Elementary School is located in a quiet neighborhood of older, well preserved homes. The campus borders School Avenue, a two-lane paved street that turns on the west side of the campus and extends to the front corner, curves around the north side, and intersects with 7th Avenue which dead-ends at School Avenue and 7th Street. School Avenue continues to 8th Avenue where it dead-ends at the school property line. School Avenue begins at the southwest corner and intersects with 10th Street South that runs east to State Highway 19. The school property ends approximately 300 yards before 10th Street reaches the highway. School Avenue is a one-way street that extends around the school building. Buses load and unload on School Avenue near the west side of Red Bay Elementary School. Parents leave and pick up their children on the front or north side of the school located on School Avenue. Figure 4.7 represents the layout of the Red Bay Elementary School.

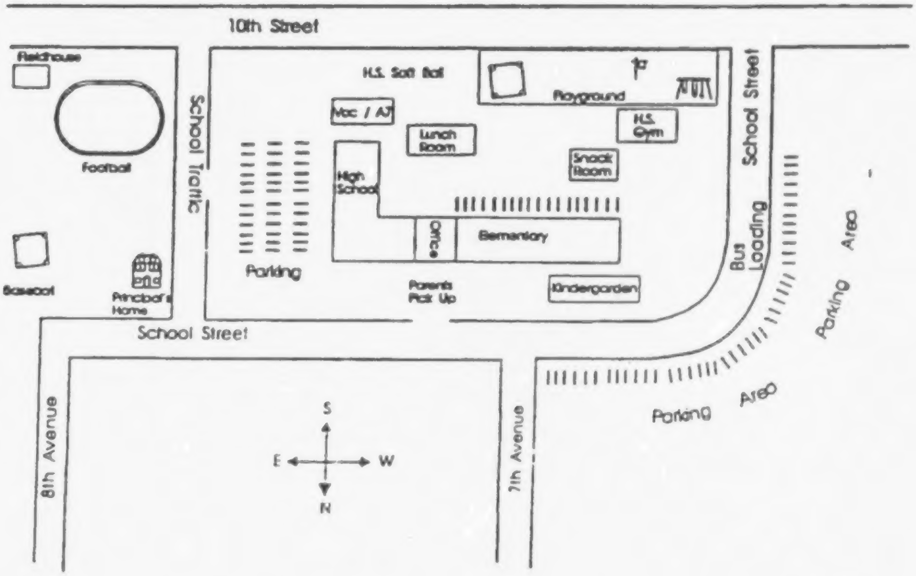
10th Street
Fieldhouse
Football
Baseball
Principal's Home
School Traffic
H.S. Soft Ball
Voc / AT
Lunch Room
Playground
H.S. Gym
Snack Room
High School
Office
Elementary
Parking
Parents Pick Up
Kindergarden
School Street
Bus Loading
Parking Area
Parking Area
School Street
8th Avenue
7th Avenue
S
E
W
N

Figure 4.7. Red Bay Elementary School. (Graphic representation is not to scale.)

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Building and Grounds

Red Bay Elementary School was built in 1967 and is typical of school architectural designs common to the period. The building is a single story, flat-roofed structure with the central heating and cooling units located on the roof. The classrooms are arranged in three-room pods. The pods are designed for open classrooms by pushing the accordion-type walls together. The original design had an open space with no doors to the rooms from inside the building (hallways). Each room in the pod has an exit door to the outside. A sidewalk (not covered) occupies the entire length of the building. There are four pods on the north side of the building, and four pods on the south side of the building. There are four hallways. One hallway on the north side runs east and west for the length of the building, connecting on the east side to the main hallway from the entrance that runs north and south. There is another hallway that runs east and west on the south side of the building near the pods on the south. A short hallway on the west end of the building runs north and south, connecting the two east and west hallways. The main entrance hallway extends past the elementary auditorium and continues past the two connecting hallways to the pods for about 50 feet to the office complex. The office complex separates the elementary school from the high school. Restrooms for girls and those for boys are located in the center of the east and west hallways. The girls' restrooms were located on the south hallway and the boys' on the north hallway. The library, an elementary lecture room, the teachers' lounge, a connecting hallway, girls' restrooms on the north hallway, boys' restroom on the south hallway, the reading room, and the boiler room were placed in this area.

The kindergarten building located to the north of the main building (approximately 30 feet) is connected from the east end to the front entrance of the main building by a covered walk. The building was constructed in 1990 by the City of Red Bay and presented to the Franklin County Board of Education for the betterment of education. The building extends in an east-west direction. A hallway extends down the center of the edifice. The building contains eight modified classrooms. The roof was covered with fiberglass shingles and displays a gable design.

There was a paved parking lot on the south side of the main building. A second parking area was located on the west side of School Street. The lot extended from the south side of the elementary school to the north side and to the intersection of 7th Avenue (approximately 300 feet). The lunchroom was separated from the main building by approximately 250 feet. The children cross the south parking lot and walk past the snack area to gain access to the lunchroom. Since there was no covered walk to the cafeteria, teachers and students use this route to the cafeteria when weather permits. During inclement weather classes pass down the high school hallways until they reach a breeze-way. They then turn onto a covered walkway that leads to the lunchroom. There were two entrances and four exits for the lunchroom. Two exits were also the two entrances from the north end and two additional exits (for safety) were at either side of the dining room near the front (south). All exit lights were on.

A six-foot, chain-link fence enclosed the playground. Two water fountains were available for the children. The fountains were placed at an entrance and exit. The playground was located to the rear of the high school gym. The walkway to the front of the gym was paved with asphalt. A large piece of the pavement had broken from the walkway leaving a large gap. The playground was large and well-equipped. The first thing observed, upon entering the playground, was a row of six jumping horses for primary grades. Directly behind the high school gym was a large paved area with four basketball goals and enough room for 50 to 60 students to perform P.E. exercises (knee bends, jumping jacks). There was a coach assigned for structured P.E. and to supervise the children while on the playground. Other playground equipment included 24 swings, two slides, three walking bars, and three climbing bars. One piece of equipment (the favorite of students) had steps up to three small slides. Two pieces were covered like a barrel and had small platforms on which the children could stand. These pieces of equipment had rails to provide for the safety of students. The coach stated, "I don't know what you call it, but it's like the ones at MacDonald's." In addition, there was a softball field located on the southwest area of the playground. Children were observed playing tag with a sponge ball on the hard surface area. There was also a merry-go-round and four teeter-totters located on the playground. The teachers had a commercially constructed 12-foot-by-14-foot cover they could sit under while observing the children. The cover was located toward the center of the playground. Observations could be conducted to supervise children on all areas of the playground.

The bus loading and unloading zone was near the west entrances of the elementary school on School Street. A covered sidewalk was located from the southwest entrance extending to the northwest entrance of the main building. Kindergarten children had an uncovered walkway on the west end of their building that connected to the bus loading zone. During inclement weather the kindergarten students may pass out of the east entrance under a covered walk to the main building and walk down the hallway to the west exit. The route provided a covered walkway to the bus. The bus drivers were instructed to park their buses in a staggered position to block the street from traffic during loading periods. All buses leave at the same time, following the lead bus, to prevent traffic problems. Parents pick up elementary children from a covered walk at the north entrance of the main building.

The school grounds were well-maintained in some areas of the campus and not very well-maintained in other areas. A pile of leaves and paper was located in the corner between the building and steps for several days. Very few parents or visitors use the main entrance; however, children travel this area when moving from the kindergarten building or when leaving the main building for parents to pick them up after school has ended. One must walk in a southerly direction on the covered walk, from a point where parents drop off their children, to a point that connects a covered walk extending from the kindergarten building to the front steps in order to enter the main building. There are four steps covered with green outdoor carpet that lead onto a 5-foot-by-8-foot porch that extends to the entrance. There is a ramp for wheelchairs on the west side of the steps. The entrance has double, full-glass doors encased in metal that open on to a spacious hallway. The hallway extends past the elementary auditorium on the east and the two hallways on the west. The hallway also extends to the elementary pods and to the administrative offices that separate the elementary level classrooms from the high school classrooms. One corner of the outdoor carpet on the porch had torn and was folded back about 2 feet, requiring personnel to step over the hump.

There were no shrubbery planted around the kindergarten area. Evidence of kindergarten children's work could be seen from School Street and 7th Avenue. The teacher-made and children-made work was attached to the windows on the north and south side of the building. Sidewalks around the elementary building appeared to be in good condition. A large sign that prominently displayed the words "Red Bay School," with flowers and low shrubs around it, presented a pleasing sight. The large pine trees in front of the building gave a peaceful appearance. The flashing along the roof was observed to need painting, especially on the west side of the building near the bus loading zone. Electrical power to the campus was provided overhead and cables were erected through the boiler room on the west side of the building.

Interior Observations

Administrative Office Space

The elementary principal's office was located in the elementary library located near the center of the main building. The principal's office measured 156 square feet. Light green carpet covered the floor. The office was equipped with central air and heat. The furniture consisted of an executive desk with chair, a computer and cabinet, a large built-in bookcase, an antique desk (open type with two small drawers on the side), a couch with a matching chair, a filing cabinet, and one extra chair. The furniture appeared to be in excellent condition. The lighting consisted of two fixtures flush with the 9-foot acoustic ceiling. The light fixtures contained four fluorescent bulbs, 4 feet in length, that provided excellent lighting for the office.

When the principal was asked how he liked the location of his office he replied:

> Six years ago when I first came here I had my doubts about having my office in the library which is in the middle of the elementary school. Now, I would not move because it gives me interaction with the children on a daily basis. The children see me not just in here, they see me out in the library. I can talk with just about every child once a week without even making any attempt to. This makes a good school climate.

The hallway leading from the elementary school intersects with the high school entrance area in front of the administrative complex. The secretary/receptionists' area contained a large solid fixed glass frontage that extended across the office. The office contained 180 square feet and extended across the office complex. An open hallway started about the center of the office. This hallway led to K-12, the principal's office, a restroom, and the counselor's office (west side). It dead-ended at a long narrow room that (like the secretary/receptionists' office) extended across the entire complex. This room was used for storage of materials. The business office and the record's storage room were located on the east side of the hall. The secretary/receptionists' office contained teachers' mail boxes on the west wall. Other furnishings in the area included a copy machine, a computer on a small table, a large communication console, three filing cabinets, a built-in bookcase, and an executive-type desk with chair. The entire complex had brown carpet, central air and heat, a 9-foot acoustic ceiling, and flush fluorescent lighting.

The K-12 principal's office was 195 square feet, not including the small private restroom. The walls were walnut panel with various plaques, letters of appreciation, and so forth. There were also stuffed fish and scenic pictures placed on the wall. The office furnishings consisted of an executive desk with chair. In the rear of the desk was a tall bookcase with open shelves, filled with notebooks, magazines, and papers; one filing cabinet; a couch with matching chair; a bookcase with a weather radio and clock sitting on top; and an extra chair. The furniture in the principal's office was in fair condition; the arms on the executive chair were worn through to the fabric.

Outside the secretary/receptionists' office, near the entrance area, were five park benches placed in convenient locations to allow for the comfort of visitors, parents, and students. There was no couch or chair for personnel to sit on in the secretary/receptionists' office. No windows were located in any office or room within the administrative complex.

Lunchroom and Restrooms

The lunchroom is located far enough away from the classrooms that noise is not a problem. This area is located in a separate building that is spacious and inviting in appearance. Five double windows are on the west and east side of the building. Each window is 5 feet high and 32 inches wide and low enough to provide a view of the outside area. The building has central air-conditioning and heating. The floor is terrazzo and in excellent condition. Tables are 8-foot, adjustable, wood grain finish with chrome legs. Chairs are made of brown plastic with chrome legs. The chairs match the tables. Tables and chairs are arranged in rows that allow adequate space for movement. There is a communication system present and the serving line is arranged behind glass steam tables. Primary grades experience no problems in the serving area; it is arranged to accommodate their needs. The ceiling consists of acoustic panels with 35 lighting fixtures flush with the ceiling. The lighting is excellent in the dining area. The kitchen has modern equipment and is well-organized for efficiency. One worker stated, "I tell you it's a pleasure to work in this lunchroom compared to what we used to have."

The student restrooms at Red Bay School are located at each end of the halls in the main building. There are four restrooms, each 225 square feet, two for girls and two for boys. Each boys' restroom has three wash basins, four urinals, and three commodes. Each girls' restroom has three wash basins and five commodes. One teacher stated, "I wish we had twice as many bathrooms." Another teacher stated, "It's really not that bad if you work it just right." The kindergarten building has classroom contained restrooms. All teachers expressed positive reactions about this feature.

Auditorium and Lecture Room

The elementary principal summed up the feelings of teachers and himself when he stated:

> The elementary school is very fortunate in having such a nice auditorium just down the hall. You can't beat the location. Children don't have to put on coats, just walk to the end of the hall and you are there. The seating, lighting, sound equipment, and stage area are excellent. I'm glad we have it.

The auditorium seats 840 people with padded theater-type seats. The seats are staggered and the seating area slopes from the back or entrance down to the stage area. The stage curtain is of a beautiful blue color with light beige curtains in the background. The stage is rather large, 30 feet by 54 feet, or 1,620 square feet. The stage is equipped with a piano, good flood and stage lights, a communication system, and good overhead lighting. The floor of the seating area is constructed of a light gray tile except for the last 12 feet to the stage. A pale blue carpet across the width of the auditorium covers this area.

The elementary Lecture Room seats 60 people. The seats are desk-type (for note taking), fastened to an iron rod that extends across each aisle. Each aisle from the entrance down to the front has a four inch step-down. There are six rows consisting of 10 desks. The ceiling is white acoustic with 12 light fixtures flush with the ceiling. Each fixture holds four fluorescent, four-foot bulbs. Three of the light fixtures had the covers missing and four of the light fixtures were not burning. The floor was covered with a light gray tile. Three of the desks did not have the back supports and needed repair. This room, due to classroom shortages, is utilized for a Learning Disabled Special Education Class.

Elementary Library

The Red Bay Elementary Library is located near the center of the elementary school. The library has 1,750 square feet, not including a 90-square-foot workroom, a 90-square-foot-librarian office, and a 156-square-foot elementary principal's office. The library has a full-time librarian and is arranged to seat the primary grades in one area, with appropriate sized furniture, and the upper elementary in another area. Four computers were available for student use. A television with VCR, overhead and slide projectors, and a well-stocked book assortment were evident during the observation. The library was stocked with multicultural books in addition to other materials. A light gray bluish carpet covers the floor. The furniture appeared to be in good condition. The librarian had the top shelves around the library lined with children's handmade crafts. Various displays of art also hung from the ceiling (by string). Several of the fluorescent light bulbs were out causing the library to be somewhat dim. When asked about this, the librarian stated, "I've tried to get the custodian to replace them, but she says we are out." Books in the library were on computer checkout; also locator information was available by computer. The elementary principal stated, "You would be surprised how well the kindergarten children have learned to use these computers." The librarian replied, "Yes, they are really good."

Kindergarten

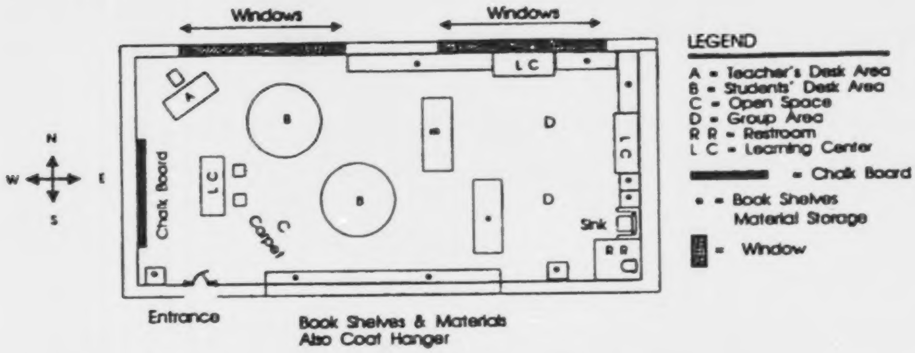
Windows
Windows
LEGEND
A = Teacher's Desk Area
B = Students' Desk Area
C = Open Space
D = Group Area
R R = Restroom
L C = Learning Center
= Chalk Board
• = Book Shelves Material Storage
= Window
N
W
E
S
A
B
B
L C
L C
L C
D
D
C
Carpet
Chalk Board
Sink
R R
Entrance
Book Shelves & Materials Also Coat Hanger

Figure 4.8. Kindergarten room at Red Bay Elementary School. (Graphic representation is not to scale.)

The visual environment of the classroom was excellent. There were no distracting shadows or glares on student work areas. The hallway outside the classroom and the classroom itself was well-decorated with the work of the students and teacher-made items. Every window contained children's work that could be seen from the outside. A large bulletin board was covered with student drawings and cutouts. The room was well organized. Tables and work areas were arranged in neat orderly sections of the room. There was ample space around

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each table and chair area for students and the teacher to move freely. The tables were located away from walls where all students could easily see the board or flip charts. The classroom noise level was very low even though there was much student movement. The researcher could hear no noise from the outside. The acoustics were such that the teacher could be heard well in all areas of the room. The open area, Area C, was ample in size. This area contained a 12-foot-by-12-foot carpet that the children liked to sit on during reading or story time. The floor was pink tile. When teachers in the kindergarten building were asked their preference in reference to tile or carpet floors everyone stated that tile was preferred. Teachers also expressed a desire for enough carpet on the floor for children to sit on during reading period.

The kindergarten room contained a restroom and sink, a 128 Laser Computer, a television with VCR, and a built-in coat rack. The room had open shelves above the sink, a coat rack, and bookshelves. The teacher made curtains and placed them around the open shelves and over the windows. The design really helped the appearance of the room. The other kindergarten teachers did similar things. All ceilings, walls, floors, and lighting were the same throughout the building. The ceilings consisted of 9-foot acoustic panels; the lighting was fluorescent and placed flush with the ceiling. The walls were light cream color, floors were pink tile, and there was central heat and air in each room. These units were controlled by the teacher. The hallway was spacious and well-lighted, with two water coolers that were located on each end of the hall. The kindergarten room was rather large, it measured 868 square feet.

Several bookcases were situated along the perimeter of the classroom. The children had individual storage boxes that were attached. These bookcases were located close to the children's work tables for convenience. Students could move about freely for a portion of the period. Movement occurred with very little distraction to classmembers. Table 4.5 provides a graphic illustration of the classroom spatial utilization by students and the teacher within the classroom.

TABLE 4.5

Classroom Spatial Utilization of Kindergarten Students and Teacher In Red Bay Elementary School (Two-Minute Intervals)

Teacher	C	C	C	C	C	C	C	D	C	A	B	B	A	A	C	B	B	A	C	B	A	A	D	A		
Aide																										
Students																										
23																										
22																										
21																										
20	C	C	C	C		C	C		C		B	B														
19								C																		
18																										
17					C					B			B											B		
16																										
15																										
14																										
13														B												
12																										
11															B	B										
10																	B									
9																		B	B							
8																				C	C		C			
7																				B	B	C	B			
6																	C	C	C			B				
5															C	C		D	D	D		D	D			
4														D	D	D	D				D					
3					D									A										A		
2										A			D									A				
1								D		D			A								A					
Time Intervals	11	48	50	52	54	56	58	12	02	04	06	08	10	12	14	16	18	20	22	24	26	28	30	32		
C/A Area	Classroom Area Percentage of Use Over Time																									
A										10			5	15							5	10		15		
B										85	100	100	85	65	55	55	50	45	45	35	35	30	35	85		
C	100	100	100	100	85	100	100	95	100						25	25	30	30	30	40	40	35	40			
D					15			5		5			10	20	20	20	20	25	25	25	20	25	25			

Aggregate % of Area Use	Refined Aggregate % of Area Use
60%	3%
905%	38%
1175%	49%
260%	11%

	AREA PERCENTAGE OF C/R By One or More Students *
A = Teacher's Desk Area	A = 25%
B = Student Desk Area	B = 62%
C = Open Area	C = 75%
D = Group Area	D = 58%

* = Time of observation period that specific spaces were utilized.

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The students returned from their lunch and play period, drank from the water fountain in the hallway, and passed into their assigned room. Students seated themselves in a semicircle on the carpet in Area C, the open area. The teacher did not need to direct students to this location. The children had settled down when the teacher entered the room. The teacher began to read to the class at 11:45 a.m. There was positive interaction between students and the teacher during story time. The teacher instructed the class to finish the work that they had initiated before they went to lunch. She informed the class that learning center activities would begin when all assigned tasks were completed. Most of the children were in their work area, Area B. They began to finish their previous work and move to other areas by 12:12 p.m. The teacher migrated to the areas where needed and returned to her desk long enough to correct a student's work or to help a student. This type teacher movement continued until class ended at 12:32 p.m. The class was observed for 46 minutes. There were 20 students and one teacher in the kindergarten class.

The observation period to determine classroom spatial utilization for kindergarten consumed 46 minutes. During the 46-minute observation, the teacher's desk area, Area A, was occupied for 12 minutes by one or more students. This use by students represents a 25% time equivalent of use for Area A. Area B, the student desk area, was occupied by one or more students for 30 minutes. This represents occupying Area B, by one or more students, for 62% of the observation period. Area C, the open area, was occupied by one or more students for 36 minutes of the 46-minute observation period. This means that Area C was occupied 75% of the 46-minute observation period. Area D, the group area, was occupied by one or more students for a total of 28 minutes. This represents occupying Area D, by one or more students, for 58% of the observation period (see Table 4.5).

The formula was utilized (as outlined on pages 105-106) to determine the refined aggregate use of the four areas by students during the observation period of a kindergarten class. Time percentage of each area utilization follows:

Area A, teacher desk area	3% area use
Area B, student desk area	38% area use
Area C, open area	49% area use
Area D, group area	11% area use

During the observation period the open area, Area C, was utilized the greatest amount of time, 49%, by the students. Area A, the teacher desk area, was utilized the least amount of time, 3% by the students.

The graph in Table 4.5 indicates that the teacher spent 27% of the class period in Area A, the teacher desk area. In Area B, the student desk area, the teacher spent 23% of the class period. In Area C, the open area, the teacher utilized 41% of the observation period, and in Area D, the group area, she utilized 9% of the period.

The teacher utilized the greatest amount of time, 41% in Area C, the open area, and the least amount of time, 9%, in Area D, the group area.

First Grade

The first-grade classroom chosen for the observation was located in the center room of pod number one. The pod was located in the northwest area of the main building. Figure 4.9 illustrates the layout of the first grade classroom at Red Bay Elementary School.

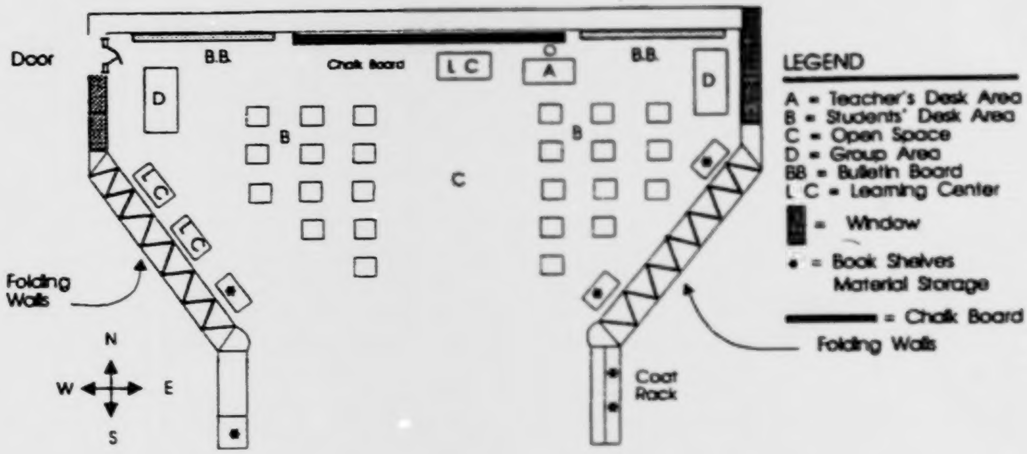
Door
B.B.
Chalk Board
L C
A
B.B.
D
D
B
B
C
L C
L C
Folding Walls
Folding Walls
Coat Rack
N
W
E
S
LEGEND
A = Teacher's Desk Area
B = Students' Desk Area
C = Open Space
D = Group Area
BB = Bulletin Board
L C = Learning Center
▮ = Window
• = Book Shelves Material Storage
▬ = Chalk Board

Figure 4.9. First grade classroom at Red Bay Elementary School. (Graphic representation is not to scale.)

There were three classrooms located in a pod. The center classroom was the largest with 568 square feet. The classrooms on each side measured 528 square feet. These rooms are small for a fairly modern building. The elementary principal stated, "What is needed is to take the

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three rooms in each pod and make two rooms." Observations and interviews indicated that teachers agree that additional room is needed. The main elementary building had central air conditioning and heating; however, the teacher in the center room of each pod controls the temperature for the total pod area. This imposes a problem for the other two classrooms. Two teachers were quite outspoken regarding the ventilation and stated, "It's usually too hot or too cold. You can't control all three rooms with even temperatures from a central control."

A block wall was constructed along the two hallways in the front of the pods from the floor to the ceiling. The main purpose of the wall was noise control Each pod was equipped with a door that could be opened and closed. Teachers stated that the accordion-type walls were never opened. They stated that parents, teachers, and administrators did not approve of the open-space class in Red Bay. Every teacher who was interviewed, who occupied a pod, did not approve of the open space classroom concept. All classrooms in the main building had brown carpet. The carpet represented another negative aspect for the teachers. The following are statements made by teachers regarding their preference for a specific type flooring:

> Carpet is good to deaden sound and is warmer, but you cannot clean the carpet. You may think it is clean, but just get down and look close and you will find it's dirty. It would be alright if half the room was carpet and the other half tile, then activities like art could

> be on tile and story telling, games, and other activities could be on carpet.
>
> I only want enough carpet for some group activities like story telling time and reading. You know we have to clean our rooms and you would be surprised how much time it takes me and I know I don't do as good a job on the carpet, I just don't have the time.
>
> When a child gets sick on the carpet, it worries me and it's hard to clean up. I think about disease, how easy it is to carry on carpet to other children. Just a little amount of carpet, just enough for children to have group activities and the rest tile would be fine.

Three small windows were located on the southeast side of the classroom and two on the northwest side of the room. The windows measured 2 feet by 4 feet. Some of the children did not have access to a view to the outside. The lighting appeared dim because of burned out bulbs in 4 of the 12 fixtures in the classroom. The teacher stated that she had reported this to the custodian several days ago and was informed that the bulbs were not in stock. The hallway had a light gray tile covering on the sections extending east and west and terrazzo on the hallway that extended from the front entrance to the office complex. The walls were cement blocks that were painted light cream. Children's work was attached to the walls along the halls. A green colored chalkboard with bulletin boards on each end was on the north wall. The alphabet and various pictures were located above the chalkboard. Teacher- and student-made decorations, drawings, and art work had been placed on the bulletin boards and walls. The room was crowded but well-organized, with learning centers, a computer, and small group areas.

There were 22 students assigned to the classroom; however, the teacher arranged the furniture in a design to provide adequate space for large group activities. Table 4.6 presents a graphic illustration of the classroom spatial utilization by the teacher and students. Carpeting reduced the noise level to an extent that the teacher could work with a group of students in Area D, the group area, and not cause noise distractions in Area C, the open area.

The observation period to determine classroom spatial utilization for first grade consumed 42 minutes. During the 42 minute observation, the teacher's desk area, Area A, was not utilized by any student. This resulted in a 0% time equivalent of student use for Area A. Area B, the student desk area, was occupied by one or more students for 36 minutes. This represents occupying Area B, by one or more students, for 86% of the observation period. Area C, the open area, was occupied by one or more students for approximately 26 minutes of the 42 minute observation period. This means that Area C, the open area, was occupied 62% of the 42-minute observation period. Area D, the group area, was occupied by one or more students for a total of 40 minutes. This represents occupying Area D, by one or more students, for 95% of the observation period (see Table 4.6).

The formula was utilized (as outlined on pages 105-106) to determine the refined aggregate use of the four areas by students during the observation period of a first grade class. Time percentages of each area utilization follows:

Area A, teacher's desk area	0% area use
Area B, student desk area	52% area use
Area C, open area	19% area use
Area D, group area	29% area use

During the observation period the student desk area, Area B, was utilized the greatest amount of time, 52%, by the students. Area A, the teacher's desk area, was utilized by students the least amount of time, 0%.

TABLE 4.6

Classroom Spatial Utilization of First Grade Students and Teacher In Red Bay Elementary School (Two-Minute Intervals)

Teacher	B	B	B	D	D	D	D	D	D	D	B	B	D	B	B	B	B	B	A	B	B	A				
Aide																										
Students																										
23																										
22																						B				
21	B	B	B											B	B	B										
20																										
19																										
18																										
17																										
16																	B			B	B					
15																		B	B							
14																										
13																										
12				D	D	D	D	D																		
11																										
10				C	C	C			D	D	D	D	D													
9																										
8							C	C	C	C	C	C	C													
7																										
6																	D	D	D	D	D					
5																										
4									B	B	B	B	B													
3																										
2							B	B																		
1	D	D	D											D	D	D		C	C							
Time Intervals	9	32	34	36	38	40	42	44	46	48	50	52	54	56	58	10	02	04	06	08	10	12				
C/A Area	Classroom Area Percentage of Use Over Time																									
A																										
B	95	95	95				9	9	18	18	18	18	18	95	95	95	73	68	68	73	73	100				
C				45	45	45	36	36	36	36	36	36	36				27	5	5							
D	5	5	5	55	55	55	55	55	45	45	45	45	45	5	5	5		27	27	27	27					

Aggregate % of Area Use	Refined Aggregate % of Area Use
0%	0%
1133%	52%
424%	19%
638%	29%

	AREA PERCENTAGE OF C/R By One or More Students *
A = Teacher's Desk Area	A = 0%
B = Student Desk Area	B = 86%
C = Open Area	C = 62%
D = Group Area	D = 95%

* = Time of observation period that specific spaces were utilized.

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Second Grade

The second-grade classroom observed in the study was located in pod number two. The classroom was in the southwest area of the main building. The specific pod of the second grade class was on the east side of the center pod. Many examples of student work were displayed. Student work was attached to the walls in the hallway near the entrance. A large bulletin board and two smaller bulletin boards on each side of the green chalkboard contained examples of students' work. The chalkboard was pitted and had several larger flakes in the surface. The teacher stated that she had it on the replacement list and felt that it would soon be replaced. Figure 4.10 illustrates the spatial organization of the second grade classroom.

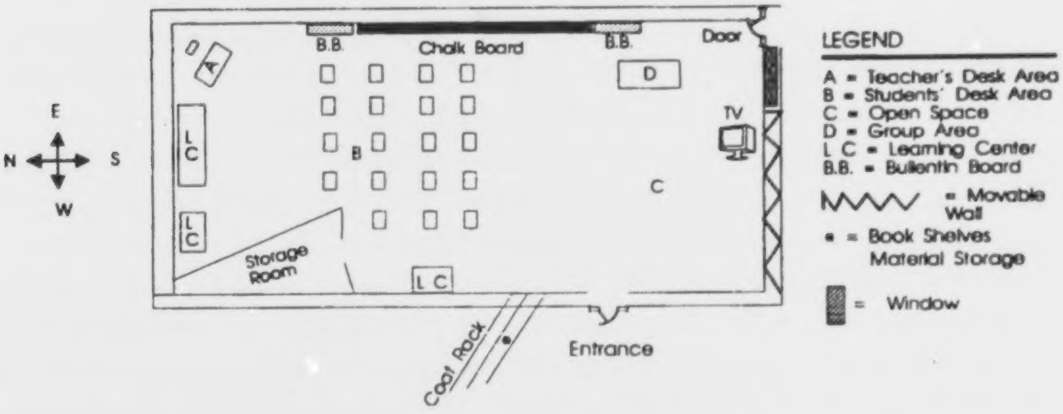
E
N
S
W
B.B.
Chalk Board
B.B.
Door
A
D
TV
L C
B
C
L C
Storage Room
L C
Coat Rack
Entrance
LEGEND
A = Teacher's Desk Area
B = Students' Desk Area
C = Open Space
D = Group Area
L C = Learning Center
B.B. = Bullentin Board
= Movable Wall
• = Book Shelves Material Storage
▨ = Window

Figure 4.10. Second grade classroom at Red Bay Elementary School. (Graphic representation is not to scale.)

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The classroom measured 528 square feet with 19 students. The room was full. A table height, homemade bookcase extended across the northern wall. The top surface of the bookcase was low enough to allow a computer, a learning center, and a record player to rest on the top section. The movable wall contained three large teacher-made posters and other decorations. Brown wall-to-wall carpet covered the floor. The folding walls (teacher called curtain) were made of a heavy material; however, one could hear the teacher or students in the next pod if they spoke aloud. There was normally a low humming sound that emanated from the other pod. There was only one small window (2 feet by 4 feet) on the outside exit located in the southeast corner of the room. The room also contained a television, three learning centers with chairs, and four extra chairs. The desks were observed to be the standard type, and were arranged in four rows that were fairly close together. The chairs were of the same design but different colors. All chairs appeared to be in adequate condition. The teacher stated that although she tried to provide as much individual instruction as possible, the limited space was sometimes a barrier to her movement around the room.

The observation period began at 8:10 a.m. and ended at 8:52 a.m. A total of 42 minutes expired during the class period. During this time several activities occurred. A 10-word, daily spelling exercise was conducted as the initial activity. The teacher assigned five sentences for students to write correctly following the first activity. Individual work was assigned during the period 8:30 a.m. to 8:38 a.m. The teacher provided instructions for math problems from 8:38 until 8:42 a.m. All the class except three students were granted free movement to study at 8:42 a.m. The three students moved to Area D, the group area, for advanced reading. The class ended at 8:52 a.m. The teacher migrated to areas where needed. She used Area D when giving instructions or using the chalkboard. A table located in Area D near the chalkboard appeared to be a convenient place for the teacher to place materials during the instructional process. Table 4.7 provides a graphic illustration of student and teacher spatial utilization within the classroom.

TABLE 4.7

Classroom Spatial Utilization of Second Grade Students and Teacher at Red Bay Elementary School (Two-Minute Intervals)

Teacher	C	B	B	B	B	D	D	D	D	D	A	A	B	B	B	B	D	A	D	D	D	A				
Aide																										
Students																										
23																										
22																										
21																										
20																										
19	B	B	B		B																	B				
18																										
17				B																						
16						B								B	B	B										
15																										
14							B																			
13																										
12								B	B								B	B	B	B	B					
11																										
10										B																
9											B															
8												B	B													
7																										
6																										
5										C	C	C	C													
4								C	C	D	D	D	D				C	C	C	C	C					
3							C	D	D					D	D	D	D	D	D	D	D					
2				C		C	D					A	A													
1						D					A															
Time Intervals	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	50	52				
C/A Area	Classroom Area Percentage of Use Over Time																									
A											5	11	11													
B	100	100	100	89	100	84	74	63	63	53	47	42	42	84	84	84	63	63	63	63	63	100				
C				11		11	16	21	21	26	26	26	26				21	21	21	21	21					
D						5	10	16	16	21	21	21	21	16	16	16	16	16	16	16	16					

Aggregate % of Area Use	Refined Aggregate % of Area Use
27%	1%
1624%	75%
268%	12%
259%	12%

A = Teacher's Desk Area
B = Student Desk Area
C = Open Area
D = Group Area

AREA PERCENTAGE OF C/R By One or More Students *
A = 14%
B = 100%
C = 67%
D = 76%

* = Amount of observation period that specific spaces were utilized.

The observation period to determine classroom spatial utilization, for the second grade, consumed 42 minutes. During the 42 minute observation, the teacher's desk area, Area A, was occupied for six minutes by one or more students. This use by students represents a 14% time equivalent of use for Area A. The student desk area, Area B, was occupied for 42 minutes by one or more students. This use by students represents a 100% time equivalent of use for Area B during the observation period. The open area, Area C, was occupied for 28 minutes by one or more students. This use by students represents a 67% time equivalent of use for Area C during the observation period. The group area, Area D, was occupied for 32 minutes by one or more students. This use by students represents a 76% time equivalent of use for Area D during the observation period (see Table 4.7).

The formula was utilized (as outlined on pages 105-106) to determine the refined aggregate use of the four areas by students during the observation period of a second grade class. Time percentages of each area utilization follows:

Area A, teacher's desk area	1% area use
Area B, student desk area	75% area use
Area C, open area	12% area use
Area D, group area	12% area use

During the observation period the student desk area, Area B, was utilized the greatest amount of time, 75%, by the students. Area A, the teacher's desk area, was utilized by students the least amount of time, 1%.

Exterior Observations and Maintainability

The Red Bay Elementary School campus is located on approximately 35 acres. During a taped interview the K-12 principal stated:

> The Red Bay campus is nothing like it was just 15 years ago. We have built new buildings, added on to others until we have just about run out of room. The way we had to build has presented some problems. I'm not satisfied with the elementary playground being so far out, or traffic problems when the buses come in or leave. The parents drop off their children about the same time. If they could use the front area it would help but another traffic jam would occur. That's not enough room in the front to handle the volume, so most of them use the parking lot behind the buses and with parents coming and going, and children running this way and that, an accident could very well happen. I've studied the problem and had others to study it also, but right now this is the best we can do.

Observations revealed that the campus grounds could be better maintained. The front entrance to the elementary school was littered with trash and no flowers or shrubs were around the kindergarten building that was constructed in 1990. The physical education teacher said that he had adequate room to accommodate daily plans and units of study for physical education classes. Structured physical education classes are conducted on the hard surface on the elementary playground when weather conditions are appropriate to permit outdoor classes. During inclement weather physical education was conducted in the elementary gym. There were from 34 to 40 students in each physical education class.

During recess, the second grade children spent most of their time on one particular set of climbing bars, and on the slides and swings. The playground provided adequate space for all students. Several of the children played on the hard surface with a sponge ball in a game called tag. A few children played on the teeter-totters and one or two pupils played on the balancing bar. There were no children observed playing on the other climbing bars, merry-go-round, or other types of equipment on the playground. The physical education teacher (coach) was in charge of the playground. The K-12 and elementary principals commended the coach for his excellent performance in supervision. They were especially complimentary about his attention to safety. They stated accidents and broken bones had decreased by 90% after the employment of a certified physical education teacher. The physical education instructor and other teachers could observe play from a commercially constructed cover (open on all sides) that was located near the center of the playground. There were no prepared landing areas under playground equipment.

Red Bay Elementary has one full-time custodian who is assigned to the interior of the elementary school and one full-time custodian who is assigned to the exterior for grades K-12. Teachers are responsible for cleaning their assigned classrooms. The elementary custodian was interviewed. During the interview she was asked why so many light bulbs had not been replaced in the library, hallways, and classrooms in the main building. She replied, "I guess I had better check them." When asked if she had any in stock she stated, "I'll check and see." The custodian was asked to identify her most difficult task or what activity took the most time, she replied, "I don't know. I guess mopping takes more time." When asked about a urinal not working in one of the boys restrooms, she stated, "I guess I'll have to get the maintenance men to fix it." When informed that it had been observed out-of-order for a few days, she replied, "I guess I haven't had time to report it." The custodian for the outside area was interviewed and when asked what his main duties were he answered, "I try to keep this place cleaned up, these kids are something else. They just don't care. If the parents would bust their rear ends it would help." When asked who did the grass cutting and trimming, he stated, "I do and it's a job. When spring gets here it's almost a full-time job." When asked about vandalism the custodian replied, "We don't have much that I know of." When asked what he thought about teachers being required to clean their own classrooms, he replied, "It won't hurt them, they ain't got that much to do."

During a conversation with school district maintenance personnel, workers stated that they were working on a heating unit. When asked which school required the most time and attention, they replied:

> We spend more time at Red Bay, but it's a bigger school. I guess about the same according to population. This is the first time we have had trouble on heating at Red Bay. Let me see, we been one time at Belgreen, one time at Vina, so I guess it evens out.

Perceptions

Users' Perceptions

Teachers, administrators, and support personnel were asked for their perceptions concerning the effects of the facility on the learning climate. To gather this data the researcher used interviews, general conversations, and the Teacher's Educational Facility Perception Questionnaire.

When teachers and administrators were asked to describe the most positive aspects of the campus the following replies were provided:

a. Each teacher alluded to the cooperation of city administrators in using money for Red Bay School through a special tax. Respondents also expressed the opinion that the cooperation of citizens and industry through the organized Education Foundation Program that furnishes money for supplies and materials was a positive feature. The fact that teachers are able to list what they need and to prioritize these needs was also listed as a positive factor. Teachers reported that the list is submitted to a committee that develops a final priority list. Requests are then approved and all teachers are informed regarding the approval, deferment, or denial of their request(s).

b. The location of the elementary auditorium was a positive factor.

c. The location of the elementary library was a positive factor.

d. Elementary teachers were proud of their principals. Teachers expressed a feeling of security with their leadership.

e. Support personnel liked the working hours, location of the building, and their supervisors.

f. Personnel in the kindergarten building felt privileged to have a building that was adequate to meet their needs and the needs of students.

The principal (K-12) indicated many retired citizens and parents provided volunteer service in the classrooms during one- or two-hour periods each day. He stated that the residents felt an ownership for the campus. One business man constructed a paved track around the football field. Many people walked on the track for exercise at all hours of the day. One teacher stated that she would not be afraid to come to the school at midnight.

The most negative comments focused on the classroom pods. Teachers felt the classrooms were too small, with 528 square feet to 568 square feet. They also expressed that there were not sufficient windows in the rooms. One teacher stated, "I think small children should be able to see nature, rain, snow, or sunshine." The carpet represented another concern of teachers who taught in the main building. Most of the teachers wanted the room to contain about half carpet and half tile, for cleanliness and sanitation. Teachers who taught in the kindergarten, where floors were all tile, were asked their preferences regarding tile or carpet. They all replied "tile." Children being required to walk across a parking lot to gain access to the cafeteria and playground was another negative aspect of the facility identified by teachers.

Teachers' Perceptions

The *Teacher's Education Facility Perception Questionnaire* was completed by each teacher on the Red Bay Elementary campus. Their perceptions regarding whether the school provided an effective learning climate based on the following standards were addressed on the questionnaire:

a. Illumination
b. Noise
c. Color
d. Thermal Environment
e. Space
f. Location
g. Maintenance
h. Esthetics
i. Safety

Table 4.8 provides a composite of the results from the *Teacher's Educational Facility Perception Questionnaire*.

TABLE 4.8

Composite Results of the Teacher's Educational Facility Perception Questionnaire at Red Bay Elementary School

STATEMENTS OF EFFECTIVE SCHOOL LEARNING CLIMATES	RESPONSES TO		
	YES	NO	SOMEWHAT
1. The exterior of a school should be pleasing in appearance.	20	0	7
2. The school facility contributes to the positive and negative attitude of teachers.	20	1	6
3. The facility allows for flexibility in teaching.	9	10	8
4. The facility contributes to a desire to continue teaching in the building.	15	4	8
5. The building and grounds provide a safe environment for students and teachers.	18	2	7
6. Large classroom size facilitates effective teaching.	11	14	2
7. The classroom promotes positive social interaction among students.	21	2	4
8. The classroom size allows for a wide variety of learning and teaching styles.	7	19	1
9. Classroom size restricts the movements of students and teachers.	20	5	2
10. Classroom size fosters a variety of teaching methodologies.	5	15	7
11. The organization and arrangement of the classroom fosters pride in students and parents.	16	2	9
12. The teacher maintains adequate control of the classroom physical environment.	25	0	2
13. The classroom accommodates the individuality of the student.	6	12	9
14. The classroom has ample storage areas for teacher materials.	4	20	3
15. Classroom storage areas do not occupy needed instructional space.	10	10	7
16. Classroom storage is used only for storing instructional materials.	15	7	5
17. Flexible walls and movable partitions enhance the effectiveness of instructional space.	3	21	3
18. Good school locations positively affect learning climate.	22	2	3
19. Well maintained school facilities promote positive learning environments.	19	2	6
20. The facility enhances the teacher's ability to perform in accordance with the goals and objectives of the district.	14	2	11
21. Illumination (lighting) provides for adequate visual environment in the classroom.	21	3	3
22. Proper acoustics prevail thereby eliminating unnecessary noise.	3	20	4
23. Classrooms are located in areas which insure the elimination of noise which could contribute to an unpleasant climate.	3	14	10
24. Color schemes enhance the esthetics of the building.	16	6	5
25. The thermal environment contributes to the maximum comfort of students.	15	5	7
26. The building and grounds have a pleasant appearance which is esthetically pleasing.	7	4	16
TOTALS	345	202	155
PERCENTAGES	49%	29%	22%

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Results presented in Table 4.8 show how teachers at the Red Bay Elementary School perceived their facility based on statements on the questionnaire which focus on characteristics of a facility that contribute to an effective learning climate:

Illumination. Teachers' responses to the statement, "Illumination provides for adequate visual environment in the classrooms," revealed that teachers felt that their school provided adequate illumination to offer an effective learning climate. Twenty-one selected "Yes," three selected "No," and three selected "Somewhat." The percentages are: 78% "Yes," 11% "No," and 11% "Somewhat" to item 21 on the questionnaire.

Noise. The statement, "Classrooms are located in areas that insure the elimination of noise that could contribute to an unpleasant climate," received a negative answer. A majority of respondents did not agree that the Red Bay School provided adequate noise prevention to meet a standard for providing an effective learning climate. Only 11% responded "Yes," while 52% responded "No" and 35% responded "Somewhat" to this item (item 23).

Color. The statement, "Color schemes enhance the esthetics of the building," received a positive answer. Fifty-nine percent of the teachers responded that the color schemes at the Red Bay School contributed to an effective learning climate, 22% responded "No," and 19% responded "Somewhat" to item 24 on the questionnaire.

Thermal Environment. The statement, "The thermal environment contributes to the maximum comfort of students received a positive answer. Fifty-six percent of the teachers responded that the thermal environment at the Red Bay school contributed to an effective learning climate, 19% responded "No," and 26% responded "Somewhat" to item 25 on the questionnaire.

Space. There were five items on the questionnaire that pertained to space in the classroom. These items were 6, 8, 9, 10, and 13. Teachers differed in their responses to these items. An analysis of each item revealed that 48% of the responses regarding all five items indicated that the Red Bay School does not offer adequate space to provide for an effective school climate, while 36% felt that the facility did provide adequate space, and 16% responded "Somewhat."

Location. Teachers' responses to the statement, "Good school locations positively affect the learning climate," showed that a majority of the teachers (81%) perceived that the location of the school positively affected the learning climate at Red Bay. Only 7% of the teachers responded "No" to this statement and 22% responded by using "Somewhat" (item 18).

Maintenance. The statement which read, "Well-maintained school facilities promote a positive learning environment," received a positive response. Seventy percent of teachers responded "Yes" that the maintenance contributed to an effective learning climate. Seven percent responded "No" and 22% responded "Somewhat" to item number 19.

Esthetics. Teachers' responses to the statement, "The building and grounds have a pleasant appearance that is esthetically pleasing," revealed that the majority of respondents did not agree that the Red Bay School provided adequate appearance for buildings and grounds that were esthetically pleasing. The esthetics did not meet a standard for providing an effective learning climate. Fifty-nine percent responded "Somewhat," while 26% responded "Yes," and 15% responded "No" to item 26 on the questionnaire.

Safety. The building and grounds provide a safe environment for students and teachers. A majority of teachers responded positively regarding Red Bay School and its provision for safe conditions that contribute to an effective learning climate. Sixty-seven percent of the teachers responded "Yes" to this statement, 7% responded "No," while 26% responded "Somewhat" to item number five on the questionnaire.

Teachers in Red Bay Elementary School indicated, by marking the "Yes" column on the perception questionnaire, that their school met the standard of the characteristics of an effective school on 345 out of a possible 702 response options for a composite of 49% "Yes." The "No" column, indicating that teachers perceived that Red Bay Elementary did not "measure up" to the standards of an effective school received 202 out of a possible 702 response options for a total of 29%. The "Somewhat" column received 155 responses from teachers who perceived that the Red Bay Elementary campus, to some degree, met the standard of providing an effective school climate, but not in all respects. This accounted for 22% of a possible 702 response options. Characteristics receiving the most positive response from teachers was Number 12: The teacher maintains adequate control of the classroom physical environment"; Number 18: School location positively affects learning climate; Number 7: Classroom promotes positive social interaction among students; Number 21: Illumination provides for adequate visual environment in the classroom; and Number 9: Classroom size restricts the movements of students and teachers. Receiving the most negative responses was the characteristic of flexible walls and movable partitions enhance the effectiveness of instructional space (Number 17) and proper acoustics, Number 22. Another negative response was Number 14, the classroom has ample storage. Receiving the most responses in the "Somewhat" category were characteristics Number 26, the buildings and grounds have a pleasant appearance; Number 20, the facility enhances the teacher's ability to perform in accordance with goals and objectives of the district; Number 23, classrooms are located in areas where noise is eliminated; Number 13, classroom accommodates the individuality of the student; and Number 11, the classroom fosters pride in students and parents.

Upon conclusion of the campus observations the researcher met with the K-12 and elementary principals of the Red Bay School. The general overview of the information on learning climate and the facility gathered during the months of observation was presented for their verification. This meeting represented the final member checking activity between the principals and the researcher.

Summary

Several aspects of the Red Bay Elementary School seem to have a major impact upon the learning climate of the school. The location and condition of the auditorium appeared to enhance the learning climate of the school in a positive manner. A second group of factors that impacted the positive aspect was the location, materials, computers, and furniture arrangement of the library. The playground design, equipment, and a full-time physical education instructor added credence to an effective learning climate in the Red Bay Elementary School. The new kindergarten facility enhanced the learning climate of the school.

Classroom size in the main building seemed to have a negative impact on the learning climate of the school. Lack of windows in classrooms located in the main building appeared to have contributed to a negative learning climate. A notable negative impact at the Red Bay School was children crossing the parking lot going to lunch, snack period, and the playground. The fact that the bus loading zone and one of the parents' pick up areas were located too close appeared also to restrict the learning climate of the campus.

Overall, the Red Bay campus seemed to provide a positive learning climate.

Vina Elementary School

The Vina Elementary School was constructed in 1983. The 26 acre site is located on a paved road, one mile north of Vina, Alabama and Highway 19. Vina is a small town with a population of 435 people. Figure 4.11 provides a photograph of Vina Elementary School.

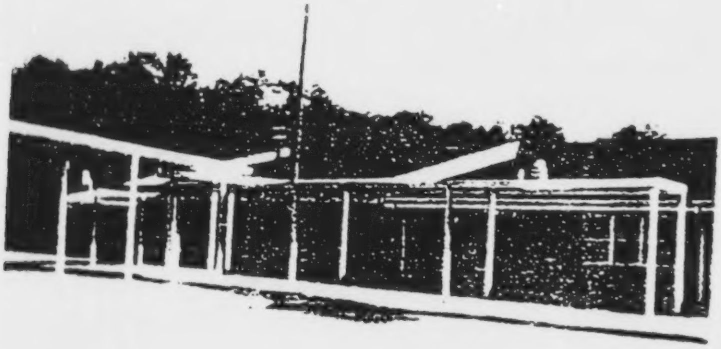

Figure 4.11. Photograph of Vina Elementary School.

Setting

The school buildings on the campus housed K-12 grades. Primary grades (K-2) are physically separated from upper elementary (3-6) and all the elementary grades (K-6) are separated from the high school. The campus is located approximately one mile from State Highway 19. There are no other noise distractions since the railroad that is located approximately 300 yards to the south of the school no longer provides service to the area.

The elementary buildings currently house 175 students, 9 teachers, 1 aide, 1 secretary, 2 administrators, 3 full-time and 1 part-time food service employee, and 1 full-time custodian. The ethnic breakdown is 99% white and 1% Hispanic. Figure 4.12 provides an illustration of the layout of Vina Elementary School.

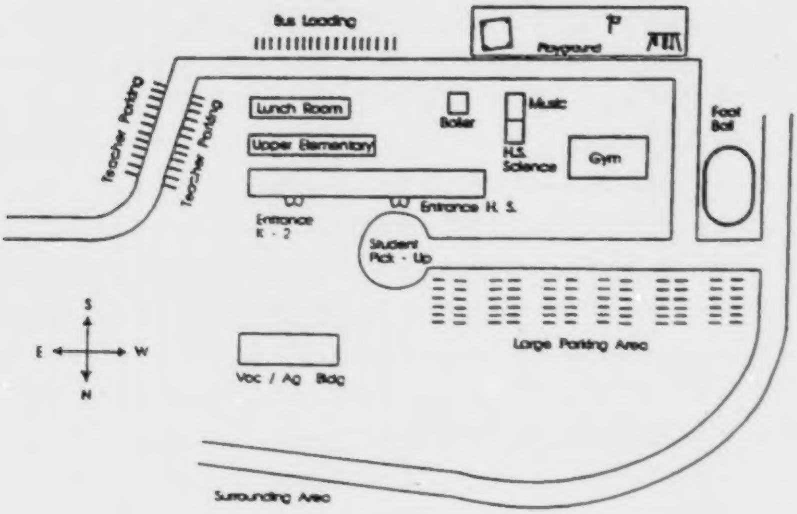
Bus Loading
Playground
Teacher Parking
Teacher Parking
Lunch Room
Upper Elementary
Boiler
Music
H.S. Science
Gym
Foot Ball
Entrance K - 2
Entrance H. S.
Student Pick - Up
S
E
W
N
Large Parking Area
Voc / Ag Bldg
Surrounding Area

Figure 4.12. Vina Elementary School. (Graphic representation is not to scale.)

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Surrounding Area

The campus is large, totaling approximately 26 acres. Should an individual leave Highway 19 and travel north, less than one mile away there would be a railroad underpass which is immediately followed by a scenic woody area. This view extends for about one-half mile. Persons entering the school campus must turn east from this location. A paved drive extends past a football field on the south and a large well-cared for lawn on the north. The paved drive leads to a large parking lot on the north or a circled turn-around area to the east that is located in front of the main building. There is a covered walkway from the circled turn-around area leading to the main entrance of the high school and the main entrance of the elementary school (separate entrances). The school presents a pleasing view with shrubbery planted across the front of the building. The shrubbery has been well-maintained. Woods surround the campus with a few homes in the distance that are almost concealed by the trees. One teacher stated, "I think we have the most beautiful campus in the county system." This statement appeared to have summarized the consensus of the teachers and administrators that were involved in this study. The grounds surrounding the building are well-maintained. The landscaping was groomed and aesthetically pleasing. The railroad embankment located to the south is concealed by trees. More than one teacher made the remark, "We have nature trails in the woods where we take the children to study nature." The playground is located to the southwest of the elementary school, enclosed by a six-foot, chain-link fence. The playground contains a hard surface with two basketball goals. It is a rather large area; however, there appears to be a shortage of equipment. Two swing sets consisting of six swings, one slide, a teeter-totter, a jumping horse, one set of climbing bars, and a balance walk have been placed on the playground. The principal remarked, "I know that we need more equipment, but I made the choice to spend the money on a structured P.E. program." During inclement weather physical education programs and play periods are conducted in the K-12 gym. There is no auditorium at Vina Elementary School. All activities that include large groups are conducted in the gym, for instance, plays, student assemblies, and PTO.

The campus has ample parking for students, high school teachers, and visitors. The parking area is located to the front of the main building. Elementary teachers and lunchroom workers prefer to park on the east side of the elementary building. One teacher stated, "It's handy, I just wish we had the money to pave our parking area." Vina Elementary School appears to have a safe situation for loading and unloading buses. The bus zone is located south of the lunchroom in an area prohibited to other vehicles.

The parent pick up zone is located on the north side of the main building at the turn-around circle.

Building and Grounds

The main school building was modern in design and pleasing in appearance. It was constructed of red brick. The entrance was inviting with covered sidewalks leading to the front entrance. Neatly trimmed hedges grew alongside the building. The driveway was planned in a commendable design. The driveway area terminated with a turn-around traffic pattern next to a covered sidewalk. The main building faced the north. The roof on the north side of the building raised to a high peak in the center. There was a four-foot drop to the south roof on the south side of the building. There were 2-foot-by-4-foot windows across the building roof (from east to west) in this space. The windows were designed to help heat and ventilate the building. The roof was covered with fiberglass shingles. The large grassed area in front of the main building was beautifully landscaped and the grass had been cut and neatly trimmed.

Interior Observations

The entrance area to Vina Elementary School consisted of two metal doors painted white with 6-inch-by-3-foot glass windows in each door. Two glass panels were on each side of the doors. The dimensions of the glass panels were 2 feet by 8 feet. There were no steps at the entrance of the building. The floors in the hallways and restrooms were covered with light gray tile. All classrooms, administrative offices, and teachers' lounge floors were covered with brown carpet. The lunchroom floor was covered with terrazzo. This floor was in excellent condition except at the entrance, where the terrazzo had been worn down to the concrete in a space about 2 feet by 3 feet. All walls in the building, including the lunchroom walls, were concrete blocks painted a light cream color. Cool-white fluorescent lighting was provided throughout all buildings. Some areas had lighting placed flush with the ceiling, others had fixtures hanging below the ceiling. The elementary hallways had a variety of student displays including teacher-made materials. Cool-white fluorescent lighting was provided in the hallways from fixtures built into the ceiling. Near the office complex there was a large glass trophy case, with some of the school's trophies. Ample water fountains were located in the hallways. Elementary classes had restrooms constructed within the classrooms. Upon entering the elementary school one must turn left to gain access to the classrooms. A right turn leads to the elementary side of the library. The library separates the high school from the elementary school.

Administrative Office Space

The library is located on the left and the administrative offices are on the right side of the hall as one enters the high-school side of the main building. The outer office and waiting room were located in an area of 90 square feet. There were no windows in the area. Brown carpet covered the floor in this area. The secretaries sat at a nice executive-type desk with a work area on each side. A computer and printer, three filing cabinets, a bookshelf, and two matching chairs for visitors were located in this area. Central air and heat were observed. The ceiling was constructed of white acoustic tile panels 2 feet by 4 feet in size. Lighting was flush with the ceiling and consisted of four fluorescent light fixtures. Lighting was excellent. There was a small hallway between the secretary's office and the offices of the principal and assistant principal. The complex consisted of the secretary's office, the assistant principal's office, the K-12 principal's office, a restroom, a workroom, and a storage room. Two copy machines were available for use by teachers and office personnel; one was located in the hallway by the principal's office and the other in the workroom. The offices of the principal and assistant principal were located side-by-side and were the same size, 255 square feet. Both offices were furnished basically the same with a couch and a matching chair, a large executive desk with a leather type executive chair, a large wall cabinet for storage, a built-in bookcase, and two additional matching chairs. Two scenic pictures were placed on the walls.

The teachers' lounge was located between the library and classrooms on the elementary side of the building. The room was equipped with an automatic coffee pot, a refrigerator, and a microwave oven. A copy machine and a coke and snack machine were also located in the lounge. The floor was covered with brown carpet. A 6-foot table with six chairs of different design had been placed in the center of the room. Teachers' mail boxes were located on the south wall. There were six windows, side-by-side, 4 feet high by 2 feet wide, located on the south wall. These windows allowed teachers to observe outside areas while sitting. The Vina teachers frequently used their lounge. The principal was observed two or three times a day in the lounge socializing with teachers. There appeared to have been good rapport among teachers and between teachers and administrators. The principal made the following statement to the researcher:

> I hope you like coffee, because we always have it all day long. If you come into the lounge and there's no coffee, just holler and I'll make some.

Faculty restrooms, for both men and women, were located across the hall from the teachers' lounge. Student restrooms were located in each individual classroom. Elementary teachers stated they were happy with their rooms and wished the other teachers in the county system could have the opportunity they had for a good teaching environment. Each classroom had central air and heat with individual thermostats.

Classroom Observations

The classrooms in the Vina Elementary School building were adequate. They ranged in size from 792 square feet to 840 square feet. They were fully carpeted and well-equipped with bulletin boards and other learning surfaces. Each classroom had a built-in closet for material storage. Each room also had a built-in restroom with a wash basin located outside the restroom. The ceilings of all the classrooms were of the cathedral type. One side of the ceiling, toward the center of the building, was 15 feet high sloping down to 9 feet on the outside wall. The ceilings were sprayed white and had two large exposed beams painted brown. There were three rows of fluorescent light fixtures. Each row had two sets of 8 foot, two-bulb light fixtures hanging from the ceiling. The upper side of the ceiling contained a row of lights that hung about 4 feet from the ceiling. The middle row of lights hung down about 18 inches, and the lower row about 1 foot. All of the lights were about 9 feet from the floor. Each room had an Apple computer, built-in cabinets above and under the wash basin area, and a built-in coat rack.

Kindergarten

The kindergarten room chosen for observation was located on the south side of the lower elementary building adjacent to the front entrance hallway. Figure 4.13 represents a graphic illustration of the classroom spatial utilization by students and teachers.

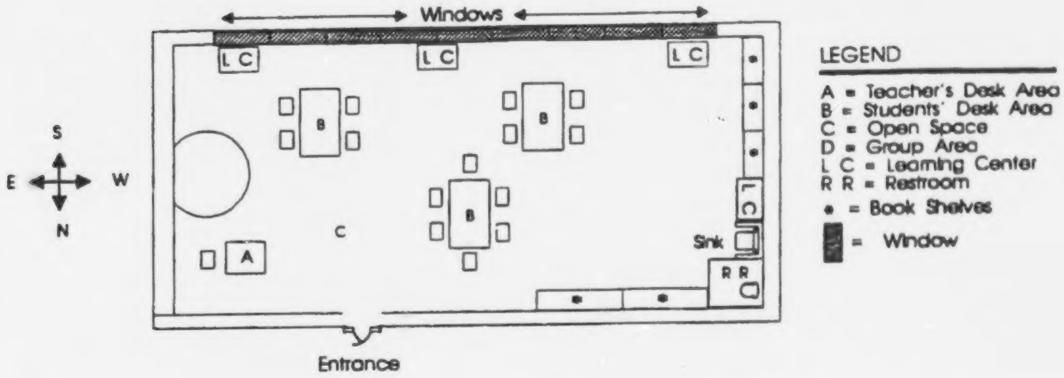
Windows
L C
L C
L C
B
B
B
S
E
W
N
C
A
L C
Sink
R R
Entrance
LEGEND
A = Teacher's Desk Area
B = Students' Desk Area
C = Open Space
D = Group Area
L C = Learning Center
R R = Restroom
● = Book Shelves
▨ = Window

Figure 4.13. Kindergarten room at Vina Elementary School. (Graphic representation is not to scale.)

The kindergarten room observed measured 792 square feet. The room was colorful and inviting. Student- and teacher-made materials were attached to the four classroom walls. Numbers and letters were attached over the windows and chalkboard. Student work also was attached to the walls in the hallway. A miniature wooden workshop occupied the southeast corner of the room. Lighting in the room was excellent: no shadows or glare were evident. The student coat rack was located inside the classroom with shelves built above the rack. Divided shelves had been placed at a point near the southwest corner of the classroom. These shelves divided the classroom into learning center areas. The shelves were low enough for the children to use the top surface for writing and for storing materials. There was an open storage area for sleeping mats, and cabinets had been placed below the wash basin. The inside restroom had one urinal and one commode. The floor was covered with light gray tile.

The student work area consisted of tables and chairs. There were two adjustable desks in the room for larger children. Every child had seating that appeared comfortable for work. The room had six windows, with dimensions 2 feet by 4 feet. All windows operated without problems. The student work area was arranged so that movement could occur without distraction to the instructional process. The teacher had identified a semi-circle, Area D, for students to sit each morning at the beginning of the school day. The first period is called news time. The teacher allows the students to use Area B, the student desk area, Area C, the open area, and Area D, the group area, at story telling time, free time, or individual work time. The classroom had central heating and cooling that was controlled by the teacher.

The observation period to determine classroom spatial utilization for kindergarten consumed 42 minutes. During the 42-minute observation, the teacher's desk area, Area A, was occupied for four minutes by one or more students. This utilization by students represents a 10% time equivalent of use for Area A (see Table 4.9). Area B, the student desk area, was occupied by one or more students for 12 minutes. This represents occupying Area B by one or more students for 29% of the observation period. Area C, the open area, was occupied by one or more students for 42 minutes of the 42-minute observation period. This means that Area C was occupied 100% of the observation period. Area D, the group area, was occupied by one or more students for a total of 40 minutes. This represents occupying Area D, by one or more students, for 95% of the observation period (see Table 4.9).

The formula was utilized (as outlined on pages 105-106) to determine the refined aggregate use of the four areas by students during the observation period. Time utilization of each area follows:

Area A, teacher's desk area	1% area use
Area B, student desk area	3% area use
Area C, open area	40% area use
Area D, group area	56% area use

During the observation period the group area, Area D, was utilized the greatest amount of time, 56%, by the students. Area A, the teacher's desk area, was utilized the least amount of time, 19%, by the students.

The graph in Table 4.9 indicates the teacher spent 9% of the class period in Area A, the teacher's desk area. In

Area B, the student desk area, the teacher spent 0% of the class period. In Area C, the open area, the teacher utilized 48% of the observation period, and in Area D, the group area, she utilized 43% of the period. She migrated to the areas where most students were located and where she was needed by the students.

The teacher utilized the greatest amount of time, 48%, in Area D, the group area, and the least amount of time, 0%, in Area B, the student desk area.

TABLE 4.9

Classroom Spatial Utilization of Students and Teacher In a Kindergarten Class at Vina Elementary School (Two-Minute Intervals)

Teacher	C	C	C	D	D	C	C	D	D	A	D	D	D	D	A	D	D	C	C	C	C	C				
Aide																										
Students																										
23																										
22																										
21																										
20																										
19																										
18																										
17																										
16																										
15																						C				
14																										
13																										
12																										
11																										
10						D	D																			
9			D	D	D			D	D		D	D						D	D		C					
8	D	D											D	D	D					C						
7										D						D	D									
6	C	C											C	C		C	C			D						
5			C	C	C					C					C			C	C		D					
4						C	C				C	C														
3								C	C																	
2								B	B	B																
1											B	B			A	A	B									
Time Intervals	12	32	34	36	38	40	42	44	46	48	50	52	54	56	58	1	02	04	06	08	10	12				
C/A Area	Classroom Area Percentage of Use Over Time																									
A															7	7										
B								14	14	14	7	7					7									
C	43	43	36	36	36	29	29	21	21	36	29	29	43	43	36	43	43	36	36	57	64	100				
D	57	57	64	64	64	71	71	64	64	50	64	64	57	57	57	50	50	64	64	43	36					

Aggregate % of Area Use	Refined Aggregate % of Area Use
14%	1%
63%	3%
889%	40%
1232%	56%

	AREA PERCENTAGE OF C/R By One or More Students *
A = Teacher's Desk Area	A = 10%
B = Student Desk Area	B = 29%
C = Open Area	C = 100%
D = Group Area	D = 95%

* = Amount of observation period that specific spaces were utilized.

First Grade

The first-grade classroom observed in the Vina Elementary School was located adjacent to the east exit in the primary grade area. Figure 4.14 provides the spatial organization of the classroom.

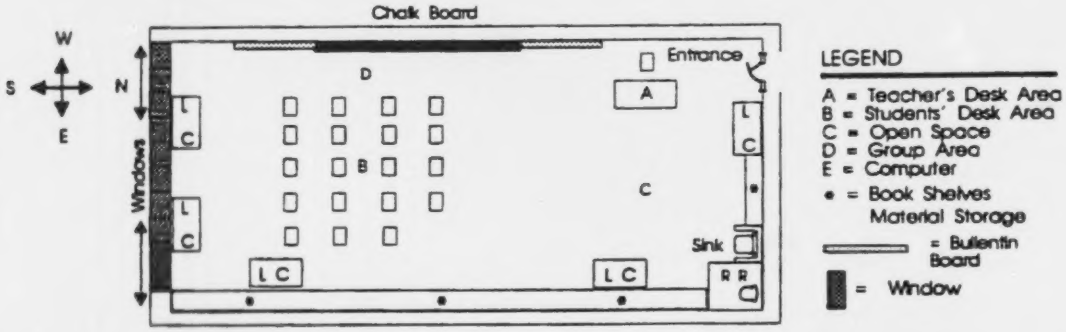
Chalk Board
W
S
N
E
Windows
Entrance
D
A
B
C
L C
L C
L C
L C
L C
Sink
R R
LEGEND
A = Teacher's Desk Area
B = Students' Desk Area
C = Open Space
D = Group Area
E = Computer
• = Book Shelves Material Storage
= Bullentin Board
= Window

Figure 4.14. First grade room at Vina Elementary School. (Graphic representation is not to scale.)

The first-grade classroom occupied an area of 840 square feet and accommodated 19 students. The room had ample room for movement. The student desks were adjustable, with a flat surface for working. These desks could be pushed together to form a small group area with a smooth top. The chairs were not attached to the desks. Chairs were made of plastic and had metal legs. The storage area was under the top of the desk with adequate space. Right- or left-handed students could use the desks without difficulties. The teacher stated, "This type desk and chair are handy; if you want a child up front they can bring their chair with no trouble." One teacher in the Belgreen Elementary School used the Vina School as an example of the type desks they would prefer. The classroom had a brown chalkboard with bulletin boards located on each end. The bulletin boards contained many examples of students' work. Each of the four walls and the hallway had student- and teacher-made decorations. The teacher had arranged learning centers all around the room. One center consisted of an Apple computer. A time-out area was constructed between a bookshelf and storage area. A wash basin was constructed next to the restroom with cabinets located above and below. Restrooms were of the same dimensions and furnished in the same manner in all the primary rooms. Windows were located across the south side of the room. There were nine window units, 2 feet by 4 feet. The room had central air and heat which the teacher controlled. The entire east wall contained shelves for books, storage of learning center materials, and sleeping mats. This shelf was low enough to be used for two learning centers and items such as a radio and record player. A listening center with tapes and a consonant sounding machine were also located in this area.

The teacher required that each student tape a litter bag on the side of the desk. The teacher stated that this procedure reduced traffic and helped to keep the room clean. The room was exceptionally clean. The lighting was excellent and the room contained a built-in coat rack with shelves constructed overhead. Several visual aids and materials were noticeable in the room. The teacher stated that Area C, the open area, was used for story time, free choice of work, and group games. Table 4.10 provides a graphic illustration of the movement patterns of student and teachers within the room.

TABLE 4.10

Classroom Spatial Utilization of Students and Teacher In a First Grade Class at Vina Elementary School (Two-Minute Intervals)

Teacher	B	B	B	C	C	C	C	C	C	D	D	B	C	C	C	B	B	B	C	B	B					
Aide																										
Students																										
23																										
22																										
21																										
20																										
19																B	B									
18																		B								
17																			B							
16																				B						
15																										
14																					B					
13																										
12																										
11	B	B																								
10			B	B	B																					
9						C	C	C	C	C	C	C	C	C	C											
8																										
7																										
6						B				B	B	B	B	B	B											
5	C	C	C	C	C		B D	B D	B D																	
4			D	D	D	D				D	D	D	D	D	D											
3	D	D																			D					
2																			C	C	C					
1																		C		D						
Time Intervals	9	37	39	41	43	45	47	49	51	53	55	57	59	10	03	05	07	09	11	13	15					
C/A Area	Classroom Area Percentage of Use Over Time																									
A																										
B	58	58	53	53	53	32	26	26	26	32	32	32	32	32	32	100	100	95	89	89	73					
C	26	26	26	26	26	47	47	47	47	47	47	47	47	47	47			5	11	11	11					
D	16	16	21	21	21	21	26	26	26	21	21	21	21	21	21					5	16					

Aggregate % * of Area Use	Refined Aggregate % of Area Use
1118%	53%
638%	30%
341%	16%

	AREA PERCENTAGE OF C/R By One or More Students *
A = Teacher's Desk Area	A = 0%
B = Student Desk Area	B = 100%
C = Open Area	C = 90%
D = Group Area	D = 81%

* = Amount of observation period that specific spaces were utilized.

The observation period to determine classroom spatial utilization for the first grade consumed 42 minutes. During the 42 minute observation, the teacher's desk area, Area A, was not occupied by any of the students. This nonuse by students represents a 0% time equivalent of use for Area A (see Table 4.10). Area B, the student desk area, was occupied by one or more students for 42 minutes. This represents occupying Area B, by one or more students, for 100% of the observation period. Area C, the open area, was occupied by one or more students for 38 minutes. This represents occupying Area C, by one or more students, for 90% of the observation period. Area D, the group area, was occupied by one or more students for a total of 34 minutes. This represents occupying Area D, by one or more students, for 81% of the observation period.

The formula was utilized (as outlined on pages 105-106) to determine the refined aggregate use of the four areas by students during the observation period. Time percentage of each area utilized follows:

Area A, teacher's desk area	0% area use
Area B, student desk area	53% area use
Area C, open area	30% area use
Area D, group area	16% area use

During the observation period, the student desk area, Area B, was utilized the greatest amount of time, 53%, by the students. Area A, the teacher's desk area, was utilized the least amount of time, 0%, by the students.

Second Grade

The second-grade classroom chosen for the observation was located in the northeast corner of the building. Figure 4.15 presents a graphic illustration of the classroom spatial utilization by students and teacher.

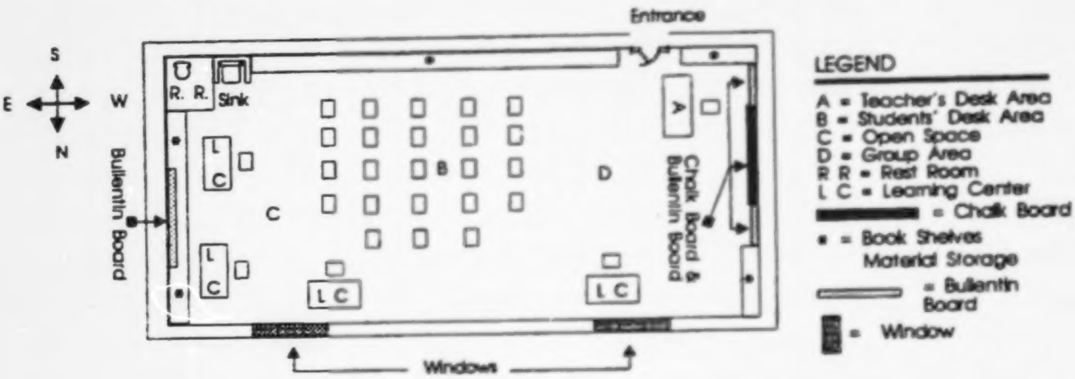
Entrance
S
E
W
N
R. R.
Sink
L C
A
B
C
D
Bullentin Board
Chalk Board & Bulentin Board
L C
Windows
LEGEND
A = Teacher's Desk Area
B = Students' Desk Area
C = Open Space
D = Group Area
R R = Rest Room
L C = Learning Center
= Chalk Board
● = Book Shelves Material Storage
= Bullentin Board
= Window

Figure 4.15. Second grade classroom at Vina Elementary School. (Graphic representation is not to scale.)

The room consisted of 840 square feet with a cathedral-type ceiling. Six double windows, 2 feet by 4 feet, were on the north wall. The windows were in excellent condition and could be easily raised and lowered. The room was well illuminated with light provided by six cool-white fluorescent fixtures, 8 feet in length. The room contained a thermostat for controlling the temperature.

Student desks were the same as those located in the first grade classroom. The desks were independent of the chair and adjustable in height. Desks were arranged in straight rows in front of the chalkboard. There was ample space for student and teacher movement between the desks and chairs. The walls were constructed of concrete blocks painted a light cream. Brown carpet was on the floor. When asked if she preferred carpet to tile, the teacher stated:

> It's a little hard to keep clean. You know the teacher has to clean their [sic] own room. Yeah, I like it when it comes time for story telling, individual projects; except painting or art; I guess overall I like carpet best.

The outlay of the rooms was the same for kindergarten, first grade, and second grade. An indoor restroom, cabinets over and under the wash basin, coat racks with overhead shelves, a bookcase reaching almost across the room with two shelves, but low enough for students to utilize the top area, and the cathedral-type ceiling with large open beams and excellent lighting existed in all classrooms. The chalkboard was brown and had a bulletin board on each end that was filled with completed student assignments and decorations. Letters of the alphabet lined the wall over the chalkboard and bulletin boards. Students' class work was attached to the windows facing outside (as was also the case in all K-2 rooms). Teacher- and student-made displays were on all four walls. This work was also displayed on hallway walls and at the room entrance. Central air conditioning and heating was available. Table 4.11 provides a graphic illustration of the movement patterns of the students and teacher within the room. There were 23 students assigned to second grade.

TABLE 4.11

Classroom Spatial Utilization of Second Grade Students and Teacher at Vina Elementary School (Two-Minute Intervals)

Teacher	D	B	B	B	B	B	B	B	B	B	C	C	B	B	B	B	B	B	C	B	D
Aide																					
Students																					
23																					
22																					
21																					
20																					
19																					
18																					
17																					
16																					
15																					
14	B																				
13																					
12		B	B																		
11				B																D	
10					D	D	D				D	D	D	D	D		D	D	D		D
9	D	D	D	D	B			C	C	C						D					
8						B	B	B	B	B						B	B	B			C
7											B	B	B	B	B				B	C	
6								D	D	D	C	C	C	C	C	C			C		
5						C	C										C	C		B	B
4					C																
3				C																	
2		C	C																		
1																					
Time Intervals	11	04	06	08	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
C/A Area	Classroom Area Percentage of Use Over Time																				
A																					
B	61	52	52	48	39	35	35	35	35	35	30	30	30	30	30	35	35	35	30	22	22
C		9	9	13	17	22	22	39	39	39	26	26	26	26	26	26	22	22	26	30	35
D	39	39	39	39	43	43	43	26	26	26	43	43	43	43	43	39	43	43	43	48	43

Aggregate % of Area Use	Refined Aggregate % of Area Use
756%	36%
500%	24%
837%	40%

A = Teacher's Desk Area
B = Student Desk Area
C = Open Area
D = Group Area

AREA PERCENTAGE OF C/R By One or More Students *
A = 0%
B = 100%
C = 95%
D = 100%

* = Amount of observation period that specific spaces were utilized.

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The observation period to determine classroom spatial utilization for second grade consumed 40 minutes. During the 40-minute observation, the teacher's desk area, Area A, was not occupied by a student for the entire observation period. This nonuse by students represents a 0% time equivalent of use for Area A. Area B, the student desk area, was occupied by one or more students for 40 minutes. This represents occupying Area B, by one or more students, for 100% of the observation period. Area C, the open area, was occupied by one or more students for 38 minutes of the 40 minute observation period. This means that Area C, the open area, was occupied 95% of the time during the observation period. Area D, the group area, was occupied by one or more students for a total of 40 minutes. This means that Area D was occupied by one or more students for 100% of the observation period (see Table 4.11).

The formula was utilized (as outlined on pages 105-106) to determine the refined aggregate use of the four areas by students during the observation period. Time percentage of each area utilization follows:

Area A, teacher's desk area	0% area use
Area B, student desk area	36% area use
Area C, open area	24% area use
Area D, group area	40% area use

During the observation period the group area, Area D, was utilized the greatest amount of time, 40%, by the students. Area A, the teacher's desk area, was utilized the least amount of time, 0%, by the students.

At the beginning of class, the teacher gave free movement to all; however, three students remained at their desk area, Area B. The three students were given a make-up reading test and other make-up assignments they had missed during an illness. The students, in free movement, collected their materials for individual projects and some of them worked in their desk area, Area B. Others migrated to Area C, the open area, and Area D, the group area.

Exterior Observations and Maintainability

The playground at Vina Elementary School was well maintained. There was a hard surface area where children were observed to remain for most of the play period. Students preferred to stay in this area more than they preferred to use playground equipment. When the weather permitted, structured physical education was conducted (calisthenics) on the hard surface of the playground. Vina had a physical education teacher that supervised the physical education program. There was a T-ball and softball field for elementary children. The play equipment consisted of six swings, one slide, a teeter-totter, a jumping horse, one set of climbing bars, and a balance walk. When asked about the playground one teacher stated, "We just don't have anything to do on the playground. There is not enough equipment." Another teacher commented, "We need a lot of work there, new equipment that is far more advanced than a slide or swing that other schools have." Every person that was asked remarked that Vina needed more and better playground equipment.

Vina Elementary School did not have an auditorium. One teacher provided the following statement when asked what were some of the negative aspects of Vina Elementary School:

> We don't have an auditorium. When we put on plays, not all of us can use the auditorium and we use the classroom and this is not good, for only a few children can see it at a time. Also, children need the experience of being on a stage.

Another teacher stated:

> When plays or other activities are put on for the public, it's very difficult. You have to use the center of the gym court without benefit of a dressing room, stage, or a curtain to use.

The Vina Elementary building had a very clean and neat appearance. The grass and shrubs appeared to have been well maintained. The facility, K-12, was served by one custodian with the part-time help of two high-school students who were on a work program. The custodian appeared to have good rapport with teachers and students. His ability to get along with others was obvious during observations around the campus. In a taped interview the custodian stated:

> It's my eleventh year working here. I've enjoyed my work. We got a wonderful faculty; I get along with them and they with me. I also love kids. It's a beautiful campus and we try hard to keep it that way. We got a wonderful group of kids; hardly any trouble at all, hardly any vandalism at all. Three years ago was the last incident. We had Coke machines broken into. They hit three schools; don't know if any of our kids were involved.

The custodian was asked if maintainability of the elementary school was difficult. He stated that very seldom did the maintenance men from the county have to be called to make repairs. He further added that grass-cutting time was the busiest; however, he had developed a schedule which allowed him to complete other tasks during this period.

One teacher stated, "We got a clean campus; the children realize it and help to keep it clean." Another teacher added, "We got a wonderful custodian. He is always busy. You see him sweeping the hallways two or three times a day and picking up trash on the grounds."

The bus loading zone was located to the south of the lunchroom. A covered walkway leads to the driveway where the buses park. The children had a short distance to walk (across the driveway) to gain access to the buses. The parent pick-up zone was located along the curb at the circled turn-around area in front of the building. There was a covered walkway to this area. The researcher observed parent pick-up in progress. There were no traffic problems. The time needed to complete the parent pick-up was approximately 15 minutes.

Perceptions

Users' Perceptions

Teachers, administrators, and support personnel were asked for their perceptions concerning the effects of the facility on the learning climate. The researcher used interviews, general conversations, and the Teacher's Educational Facility Perception Questionnaire to gather these data.

The principal made the following comments when asked about the most positive aspect of Vina Elementary School:

> One thing, we have a new building with each primary grade having self-contained restrooms.
>
> We have a small school--small faculty. We know each other and we work together.
>
> Clean campus, cleanliness; if children see trash on the floor they will throw trash on the floor. If they see it's clean, they will help you. Teachers teach the children to keep clean and help keep things clean. I consider this a strong positive act. We got one of the best janitors in the county.
>
> We have a nice lunchroom and excellent staff. They won't let a child go hungry for lack of food quality.

The researcher asked the principal what he would do for Vina Elementary School if he had unlimited funds. He replied that he would build an elementary gym to get away from basketball and a high-school program that causes so many problems in scheduling. He stated that the elementary school really needed a separate gym. The next priority he identified was an auditorium that could be used for plays, drama, and other activities. He also stated that more classrooms designed like the primary grades (restrooms, sinks, built-ins) were needed for this group of students.

The librarian was asked to give the positive and the negative aspects concerning the library. She indicated her response was focused on the negative aspects. She stated:

> I'm in the library for only a half day. I don't have the time to do all I want to do for the children, or teachers for that matter.
>
> We don't have enough books. We are slowly getting more; they are expensive, but we need more. We lost all our books and supplies in the fire back in 1982.

As for some of the positive aspects, the librarian stated:

> It's a nice clean building. The children help me keep it that way. It has excellent lighting, good carpet on the floor, and I think it's a good size library for this small a school.
>
> One thing I like about it is that I have room enough to separate the high school from elementary. Then I have tables and chairs sized for primary and the same for upper elementary. I have enough room to have a grade at a time with sized furniture. I also think we have good furniture that is in excellent condition.

The librarian was asked about multicultural books. She replied, "Oh, sure" and stated, "Look through those shelves over there" pointing to an area in the library. She further stated, "Our textbook committee selected good books with multicultural education in mind." One teacher stated, "We may be all white, but we have to teach our children how to get along in this world. We had a program on Martin Luther King last month and the other classes did also."

The custodian made the following comment when asked about the negative aspects of Vina Elementary School:

> I'd like to see us do away with the old coal fired boiler and convert it to gas. We have gas in the lunchroom, basketball gym, and the rest is heated with a coal burning boiler.

The head cook in the lunchroom was asked what she would buy if she had unlimited funds. She replied:

> I'd like another salad bar for the little children and let them serve themselves. They throw away so much

> that we put on their plate. I think we would save a lot of food. Kids are smarter than you think.

The researcher asked the teachers interviewed what they considered to be the most negative aspect of the school building. The following are some of the comments received:

> We need more covered walks, like to the gym and band room.
>
> A full-time librarian we need bad. If you want to look something up for the kids, half the time you got to find the key and look it up yourself. We need more books too.
>
> An auditorium, the children really need one. The community and all of the school needs one. We need one for plays, community activities, graduation exercises, and all kinds of activities.
>
> More playground equipment is needed, especially for the small children. The slide is too high and the swings are too. We have to lift the children up and sit them in the swings.
>
> An elementary gym is needed. It's hard to get the gym when you need it, when you got elementary and high school using the same gym.

Teachers' Perceptions

The *Teacher's Education Facility Perception Questionnaire* was administered to each teacher on the Vina Elementary campus. Their perceptions of an effective learning climate based on the following standards are described below:

a. Illumination
b. Noise
c. Color
d. Thermal Environment
e. Space
f. Location
g. Maintenance
h. Esthetics
i. Safety

Table 4.12 provides a composite of the results from the Teacher's Educational Facility Perception Questionnaire.

TABLE 4.12

Composite Results of the Teacher's Educational Facility Perception Questionnaire at Vina Elementary School

STATEMENTS OF EFFECTIVE SCHOOL LEARNING CLIMATES	RESPONSES TO		
	YES	NO	SOMEWHAT
1. The exterior of a school should be pleasing in appearance.	6	0	3
2. The school facility contributes to the positive and negative attitude of teachers.	6	0	3
3. The facility allows for flexibility in teaching.	6	1	2
4. The facility contributes to a desire to continue teaching in the building.	7	0	2
5. The building and grounds provide a safe environment for students and teachers.	7	0	2
6. Large classroom size facilitates effective teaching.	5	2	2
7. The classroom promotes positive social interaction among students.	8	0	1
8. The classroom size allows for a wide variety of learning and teaching styles.	2	2	5
9. Classroom size restricts the movements of students and teachers.	5	1	3
10. Classroom size fosters a variety of teaching methodologies.	1	1	7
11. The organization and arrangement of the classroom fosters pride in students and parents.	6	0	3
12. The teacher maintains adequate control of the classroom physical environment.	7	1	1
13. The classroom accommodates the individuality of the student.	3	2	4
14. The classroom has ample storage areas for teacher materials.	4	5	0
15. Classroom storage areas do not occupy needed instructional space.	8	0	1
16. Classroom storage is used only for storing instructional materials.	7	1	1
17. Flexible walls and movable partitions enhance the effectiveness of instructional space.	0	9	0
18. Good school locations positively affect learning climate.	8	0	1
19. Well maintained school facilities promote positive learning environments.	6	1	2
20. The facility enhances the teacher's ability to perform in accordance with the goals and objectives of the district.	5	0	4
21. Illumination (lighting) provides for adequate visual environment in the classroom.	6	1	2
22. Proper acoustics prevail thereby eliminating unnecessary noise.	6	1	2
23. Classrooms are located in areas which insure the elimination of noise which could contribute to an unpleasant climate.	5	2	2
24. Color schemes enhance the esthetics of the building.	6	1	2
25. The thermal environment contributes to the maximum comfort of students.	5	2	2
26. The building and grounds have a pleasant appearance which is esthetically pleasing.	5	0	4
TOTALS	140	33	61
PERCENTAGES	60%	14%	26%

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Results presented in Table 4.12 show how teachers at the Vina Elementary School perceived their facility based on statements on the questionnaire which focus on characteristics of a facility that contribute to an effective learning climate:

Illumination. Illumination provides for adequate visual environment in the classroom. Teachers felt that their school provided adequate illumination to offer an effective learning climate. Sixty-seven percent responded "Yes," 11% responded "No," and 22% responded "Somewhat" to item 21 on the questionnaire.

Noise. Classrooms are located in areas that ensure the elimination of noise that could contribute to an unpleasant climate received a positive response. Fifty-six percent of the teachers responded that Vina School did provide adequate noise prevention that contributed to an affective learning climate. Only 22% responded "No," and 22% responded "Somewhat" to this item (item 23).

Color. Color schemes enhance the esthetics of the building received a positive response. Sixty-seven percent of the teachers responded that the color schemes at Vina School contributed to an effective learning climate. Eleven percent responded "No," and 23% responded "Somewhat" to item 24 on the questionnaire.

Thermal Environment. The thermal environment contributes to the maximum comfort of students received a positive answer. Fifty-six percent of the respondents felt that the thermal environment at the Vina School contributed to an effective learning climate; 22% responded "No;" and 22% responded "Somewhat" to item 25.

Space. There are five questions that pertain to space in the classroom. They are 6, 8, 9, 10, and 13. Teachers differed in their response to these items. An analysis of each item revealed that 36% of the responses regarding all five items indicated that the Vina School offers adequate space to provide for an effective learning climate, while 18% felt that the facility did not provide adequate space, and 47% responded by using "Somewhat."

Location. Good school location positively affects learning climate. A majority of teachers (89%) perceived that the location of the school positively affected the learning climate at Vina School. Zero percent responded "No," and 11% responded by using "Somewhat" to item 18.

Maintenance. Well maintained school facilities promote positive learning environment received a positive response, with 67% of respondents saying "Yes," that the maintenance contributed to an effective learning climate. Eleven percent said "No," and 22% answered "Somewhat" to item Number 19.

Esthetics. The building and grounds have a pleasant appearance that is esthetically pleasing. This statement received a positive response regarding an effective learning climate at Vina. Fifty-six percent responded "Yes;" 0% responded "No;" and 44% "Somewhat" to item Number 26.

Safety. The buildings and grounds provide a safe environment for students and teachers. A majority of teachers responded positively regarding Vina School and its provision for safe conditions that contribute to an effective learning climate. Seventy-eight percent of the teachers responded "Yes" to this statement; 0% responded "No;" while 22% responded "Somewhat" to item number 5.

Teachers employed at the Vina Elementary School indicated by marking the "Yes" column on the perception questionnaire that their school met standards relative to an effective learning climate for 140 out of a possible 234 response options yielding a composite of 60% "Yes." The "No" column, indicating that teachers perceive that Vina Elementary School did not meet standards relative to an effective learning climate, received 33 out of a possible 234 response options for a total of 14%. The "Somewhat" column received 61 responses from teachers who perceived that the Vina Elementary campus met standards relative to an effective learning climate, but not in all respects. This accounted for 26% of a possible 234 response options. Characteristics receiving the most positive response from teachers were Number 7: the classroom promotes positive social interaction among students; Number 15: classroom storage areas do not occupy needed instructional space; and

Number 18: good school location positively affects learning climate. Receiving the most negative responses were the characteristics of flexible walls and movable partitions enhance the effectiveness of instructional space, Number 17, and Number 14: the classroom has ample storage areas for teacher materials. Receiving the most responses in the "Somewhat" category were Number 7: classroom size fosters a variety of teaching methodologies; Number 8: the classroom size allows for a wide variety of learning and teaching styles; and Number 13: the classroom accommodates the individuality of the student.

Upon conclusion of the campus observations the researcher met with the Vina K-12 principal. The general overview of the information on learning climate and the facility gathered during the months of observation was presented for his information and verification. This meeting was the final member-checking session between the principal and the researcher.

Summary

Several aspects of the Vina Elementary campus seem to have a major positive impact upon the learning climate in the school. The modern design and aesthetic appearance of the facility seemed to enhance the learning climate of the school. Location of the campus tended to foster a positive learning environment as well. The building interior, with carpeting throughout, and classrooms with self-contained restrooms, appeared to have a positive impact upon the learning climate. The design of the parent pick-up zone and the illumination of classrooms also appeared to enhance the learning climate.

The absence of an auditorium at the Vina Elementary School appeared to foster a negative learning climate. The lack of a covered walkway leading from the building to the gym appeared to restrict the learning climate as well. The absence of an elementary gym seemed to have a negative impact on the learning climate.

The Vina Elementary facility appeared to enhance the overall learning climate of the school.

Comparing and Contrasting the Lowe (1990) Study

The three elementary schools selected for the Lowe study were Rusk, Sam Houston, and Northside. These three schools were located in the Palestine Independent School District, Palestine, Texas. The three elementary schools selected for this study were Belgreen, Red Bay, and Vina. These schools are located in the Franklin County School System, Franklin County, Alabama.

The Rusk Elementary School was compared to the Belgreen Elementary School; the Sam Houston Elementary School was compared to the Red Bay Elementary School, and the Northside Elementary School was compared to the Vina Elementary School. Four specific areas were compared:

a. Setting

b. Interior Observations

c. Classroom Observation

d. Exterior Observations and Maintainability

Summary of Findings and Comparisons

Rationale for Pairing of Specific Schools

The selection of schools for pairing was based upon the following criteria:

1. One standard used to pair the schools was the time frame during which the schools were constructed. Each pair of schools selected had to be constructed within the same 20-year time frame.
2. A second standard used to pair the schools was that each school selected must have a similar organizational structure. The organizational structure had to include kindergarten through second grade since these were the grades targeted for observation in both studies.

Summary of Findings for Paired Schools--Exterior Observations and Maintainability

Rusk Elementary School is located in an urban area. Belgreen Elementary School is located in a rural area. Both schools were constructed in the 1930s. Belgreen School was constructed in 1933 in the Belgreen community of Franklin County, Alabama. Rusk Elementary School was constructed in 1938 on the corner of Palestine Avenue and North Jackson Street in Palestine, Texas.

The entire front of the Rusk School building is located less than 50 feet from the busy four-lane, Palestine Avenue. A stop light on the corner of North Jackson and Palestine Avenue enhances traffic congestion, noise, and air pollution in the area. The constant flow of cars, the noise and vibration of huge trucks applying loud air-brakes, and the deafening roar of diesel engines sending black smoke into the vents and windows of the school contribute to the atmosphere of Rusk Elementary School.

Rusk Elementary School is located in a low socio-economic area. In the immediate vicinity of the school are service stations, car lots, auto repair shops, several quick-stop groceries, fast-food establishments, and an abandoned carwash. Older homes, in disrepair, and several junked automobiles can be seen at various locations near the school. Most of the teachers and visitors are forced to park on the streets surrounding the school.

The Rusk Elementary Campus was extremely small, consisting of two and one-third acres. The school building occupies two-thirds of the campus leaving less than one-half acre for recess and physical education use. High grass and weeds were evident. There were no trees or shade on the playground. Several untrimmed shrubs were planted along the edge of the building.

The Rusk Elementary School building was a charming old structure complete with decorative cement facade at the entrance. A wide expanse of steps lead up to massive, double front doors. The school is constructed of reddish-brown brick with all corners and roof line trim being white cement blocks. Built in a horseshoe shape, it is a one-story, flat-roofed building. A broad sidewalk lies in front of the schools and along the north boundary.

County Highway 187 transcends the Belgreen School campus. The main school buildings are located on the east side of the highway and the school gym is located on the west side of the highway. There is a tunnel under the highway that students use to walk from the school building on the east side of the highway to the gym on the west side of the highway. The front of the main school building is located approximately 125 feet from Highway 187.

Highway 187 carries a heavy volume of traffic. In addition to local traffic, large log trucks, sand and gravel trucks (a sand and gravel pit operates approximately one mile south of the school), and coal trucks are frequent travelers on the highway. A first-come, first-serve parking area is located on the east side of the highway extending all across the main buildings around the south side to about 25 feet from the main building (see Figure 4.2). Cars must back onto the highway to gain access to the main road. Traffic congestion also exists in the parent pick-up zone located in front of the library and to the rear of parked cars along the north side of the parking area. School buses also experience a problem. Drivers having to unload must back into an area located to the front of the vocational school; often the front bumpers of buses are within 10 feet of the highway. This presents a dangerous situation for children. Parents parking on the west side of the highway compound the problem by having their children cross the highway.

The library, main building, and auditorium are on the east side of Highway 187 and faces west. The library is approximately 15 feet north of the main building and the auditorium is approximately 10 feet south of the main building. Covered walkways lead from the parking area to the front steps of the school and from the front steps to the library. Also, an uncovered walkway leads to the auditorium from the front school steps. There are nine concrete park benches, approximately 25 feet apart, along the covered walkway. Four beautiful huge oak trees are located in front of the main building. The grass and shrubbery appeared to have been well-maintained.

Standing in front of the main school building as one looks west across Highway 187, the following can be observed: 1) to the northwest is an old dilapidated wooden house; 2) south of this is a small cinder block store with two uncovered gas pumps out front; 3) a vacant area that is grown up in bushes and weeds can also be seen; 4) next to this area is a rather nice home with two or three cars, a truck, small trailer, and some farm equipment; and 5) the school gym and a parking lot are located on the south side.

On the east side of the highway the south boundary line is indicated by a 4-foot, chain-link fence that runs within 5 feet of the auditorium. A farm house is barely visible behind some tall bushes and shrubbery approximately 60 feet south of the auditorium. About 10 feet south of the fence is an old outhouse with the door missing and very much in disrepair. Next to this is a large barn that appears to need repairs. Between the fence and farm house is an open shed and an old pickup truck that is not in running condition. All this is visible from the highway or when approaching the school building from the front.

The Area Vocational School borders the north boundary of the Belgreen School. The Belgreen School campus contains 35 acres. The principal stated the Belgreen School was located in a low socio-economic area.

The Belgreen Elementary School building is typical of structures that were constructed in the 1920s and 30s in the south. The entrance is oval shaped, and constructed of brick with a cement marker overhead that has the school's name engraved on it. The school is constructed of three types of colored bricks: red, black, and dark tan. The bricks have worn well with age.

The Sam Houston and Red Bay Elementary Schools were constructed in the 1955-1967 period. Both schools are located in a suburban area of older but well-preserved homes. Sam Houston campus is small, comprising only two acres. The campus at Red Bay is much larger, comprising 35 acres.

The Sam Houston Elementary campus borders Park Avenue, a large four-lane street that runs along the western boundary. This is a busy street; however, it is adjacent to that portion of the campus most distant from the classroom building. The north boundary of the campus is bordered by a small one-way street primarily used by delivery vehicles serving the school. Lamar Street, which receives little traffic, borders the front of the school building. It is from this street that school buses load and unload and that parents leave off and pick up their children.

The building (Sam Houston School) is a single story, almost flat-roofed structure. The door to each of the classrooms opens onto an outside covered walk that is 10 feet wide and occupies the entire length of the school. The cafeteria is separated from the main building by a covered breezeway. A covered walk area extends from the breezeway to the bus loading zone on Lamar Street.

There is no faculty parking lot at Sam Houston School. All faculty and visitors must park on one of the streets. The portion of Lamar Street directly in front of the school is a bus zone where no other vehicle parking is allowed. The school grounds are well kept; however, most of the shrubs are in need of trimming. The playground is well equipped and level. Sidewalks are in good repair with no major cracks or heaves present. The exterior appearance of the building is pleasing. It is evident that the facility has been well-maintained and cared for.

The Red Bay School Campus borders 10th Street, a busy street, that runs along the southern boundary. However, it is adjacent to that portion of the campus most distant from the classroom building. School Street began at the intersection of 10th Street, located at the southwest boundary, and extended across the west school boundary around to the front of the school to the end of the north boundary at 8th Avenue (see Figure 4.7). It is from School Street that buses load and unload at the west side of the Red Bay Elementary School. The parents leave and pick up their children on the north side of the school on School Street. School Street is a one-way street that is primarily used by personnel associated with or having business with the school.

Red Bay Elementary School was a single-story, flat-roofed structure with the central heating and cooling units located on the roof. The classrooms were arranged in three room pods in the main building. Each room in the pod had an exit door to the outside. A sidewalk (not covered) occupied the entire length of the building. The kindergarten building, located approximately 30 feet to the north of the main building, was connected from the east end to the front entrance of the main building by a covered walk. This building was constructed in 1990 by the City of Red Bay. The building extends in an east and west direction. The roof was covered with fiberglass shingles and displayed a gable design. The lunchroom was separated from the main building by approximately 250 feet. The school grounds were well maintained in the lunchroom area; however, they were not very well maintained in other areas.

There was a paved parking lot on the south side of the main building. A second parking area was located on the west side of School Street. The lot extended from the south side of the elementary school to the north side and to the intersection of 7th Avenue (approximately 300 feet). The playground was large and well equipped, including a large hard surface area. Sidewalks were in good repair with the exception of the asphalt walkway to the playground that had a large chunk torn loose. With the exception of a couple of small areas on the roof trim that needed painting, the exterior appearance of the building was pleasing. It was evident that the facility had been well maintained and cared for.

Vina Elementary School and Northside Elementary School were constructed in the same 20-year time frame. Vina was constructed in 1983 and Northside was constructed in 1978. Both schools are located in a suburban setting. Both schools also have rather large campuses. The Vina School campus consisted of 26 acres. The Northside School campus consisted of 19 acres. Both schools were similar in location of buildings and noise level. Northside School was located approximately 150 feet off the highway and was insulated from traffic noise by trees between the school and the highway. Vina was located approximately one mile from a highway and was surrounded by trees.

The Northside Elementary School playground was located to the west of the school building and comprised an area approximately 200 feet by 350 feet. Several large pine trees provided ample amounts of shade. The playground at Northside was expansive with many different pieces of apparatus. All the playground equipment was relatively new and in excellent condition. The bus loading zone was located outside the cafeteria at Northside. Children loaded and unloaded beneath a covered walkway that led into the east door of the cafeteria.

The Vina Elementary School playground was located to the southwest of the elementary school and comprised an area of approximately two acres. Trees on the south side, along the playground boundary, provided an ample amount of shade. The playground was a rather large area; however, there appeared to be a shortage of equipment. The playground did contain a hard surface area that the children frequently used. Vina Elementary School appeared to have a safe situation for loading and unloading buses. The bus zone was located south of the lunchroom in an area prohibited to other vehicles.

The driveway that leads to Vina School ends at a turn-around traffic circle near a covered walkway leading to the school entrance; this is also the parent pick-up zone. One can enter a large faculty and student parking area, located in front of the school, from the driveway. The Northside School also had a large parking area that was adequate for teachers and students in front of their school. The parent pick-up zone at Northside was located on the parking lot curb in front of the main entrance to the building. The following applies to both Northside and Vina Elementary schools: The grounds surrounding the main building were well maintained and the landscaping was groomed and aesthetically pleasing. The campuses were quiet, and there was no noise from highway vehicular traffic.

Summary of Interior Observations

Belgreen-Rusk Schools. Floor covering for Belgreen School (with the exception of offices and teachers' lounge) consisted of a light gray tile. The Rusk School had a loose carpet over wooden floors in the hallways. The classrooms at Rusk still had the old original wood floors. Lighting in the Belgreen School was excellent. All ceilings at Belgreen School had been lowered to 9 feet and consisted of white acoustic tile. Fluorescent lighting was installed flush with the ceiling throughout the building. The hallway ceilings at Rusk had been lowered to 9 feet; however, the lighting in the hallways was dim. The classroom ceilings at Rusk were still the original 11-foot ceilings with fluorescent lighting dropped 2 feet from the ceiling. Classroom lighting was sufficient.

The classroom ranged in size from 638 square feet to 768 square feet at Rusk Elementary School. Each room was heated by two steam radiators; however, all classrooms had central air-conditioning. Storage areas for materials were limited. Student desks were standard with a flat table top. Kindergarten students had tables and chairs.

The classrooms at Belgreen Elementary School ranged from 660 square feet to 960 square feet. Each room was heated by two steam radiators (except the kindergarten class in the portable building) and cooled by individual air-conditioning units. Storage areas for materials were limited. Although desks for first and second graders were new, they were displeasing to students and teachers. They were made of lightweight plastic with slanting table tops which made them easy to tip over. Kindergarten classes had tables and chairs.

The restrooms at Rusk, like those at Belgreen, were located at opposite ends of the main hallway; however, at Rusk the boys and girls shared the same two wash basins that were located outside the restrooms. The girls had three commodes and the boys had two commodes and two urinals. The size of the restrooms at Rusk are unknown.

The restrooms at Belgreen were 128 square feet for each restroom. The boys' restroom had two wash basins, four commodes, and two urinals. The girls' restroom had five commodes and two wash basins.

The teachers' lounge at Rusk was small, consisting of 240 square feet. There was a single fluorescent light providing a limited amount of brightness to the room. The floor was dark hardwood with a flaking coat of varnish. Furnishings in the lounge were as follows: an old scarred library table, well-used plastic chairs, a student desk on which the telephone sat, a drink machine, a candy machine, and a coffee pot. Teachers stated they did not use the lounge much because it was too small.

The teachers' lounge at Belgreen Elementary School consisted of 352 square feet. Lighting was excellent with fluorescent lighting flush with the 9 foot acoustic tile ceiling. Furnishings included: a matching couch and chair, a coffee table, a copy machine, a three-drawer table, a large coffee pot, a microwave oven, a 6-foot folding table, the teachers' mail boxes, a small refrigerator, four chairs, a window air-conditioner, and carpet on the floor.

The administrative office at Rusk School consisted of a small, 10-foot-by-10-foot, outer office. The outer office consisted of one secretary's desk and chair, a double filing cabinet, and a visitor's chair. There was no formal waiting area. The principal's office, separated from the outer office by a door, was pleasant but small in size. Dark gray carpet covered the floor. A new bookshelf and credenza stood against the wall. A window air-conditioner, a couch, and a chair completed the furnishings.

The administrative office at Belgreen School consisted of a 253-square-foot outer office. The outer office consisted of two secretary's desks and chairs, two computers and printers, a typewriter, a 24-square-foot storage room, two filing cabinets, and a copy machine. The principal's office, separated from the outer office by a door, was large and well furnished. There was no formal waiting room. The principal's office measured 504 square feet. In addition to his office was a storage room, measuring 81 square feet, and a private restroom, also measuring 81 square feet. The office had light blue carpet, an executive desk and chair, a computer, a typewriter, a communication system, two filing cabinets, a couch with two matching chairs, four additional chairs, and a 2-foot-by-6-foot window on the north wall. The office was also equipped with a window air-conditioner and had excellent lighting.

The lunchroom at Belgreen School seats 128 students. The lunchroom had windows on the entire west wall and the floor was covered with a light gray tile. The table and chairs matched and were in good condition.

Rusk Elementary School had a cafeteria that doubled as a physical education classroom by folding the tables and rolling them against the wall. There are no windows and the floors are hardwood.

Red Bay-Sam Houston Schools. One walks in to a spacious hallway when entering Red Bay Elementary School. To the left (east) is the auditorium. Should an individual walk straight ahead (south) two hallways extending east and west past the elementary classrooms can be observed. Approximately 40 feet past the last hallway is located the office complex. This complex separates the elementary school and the high school.

There is a breezeway at the entrance of Sam Houston School. A metal door with large safety glass windows mark the entrance to the school and into the office space. There are no hallways in Sam Houston School. One enters the classrooms from a covered sidewalk.

The floor coverings for Red Bay School area are as follows:

1. Hallways extending east and west past the classrooms had light green tile.
2. Main hallway extending north and south was terrazzo.
3. Restrooms had terrazzo.
4. Classrooms were carpeted.
5. Library and elementary principal's office were carpeted.
6. Lunchroom had terrazzo.

The floor coverings for Sam Houston School are as follows:

1. Office complex had light green tile.
2. Cafeteria had wood floors.
3. Portable building (classroom and library) was carpeted.
4. Classrooms in the main building had light green tile.

The lighting system for Red Bay Elementary School was fluorescent fixtures that were flush with the ceilings. Lighting for Sam Houston was provided by dropped fluorescent fixtures that were approximately 9 feet from the floor. The ceiling at the Sam Houston School had a cathedral design.

Classrooms in the Red Bay School had central air and heat and the floors were carpeted. The rooms were located in three room pods and were small, ranging from 528 square feet to 568 square feet. Lighting was adequate; however, there were only one or two windows in the classrooms. The kindergarten rooms at Red Bay were large. These rooms had self-contained restrooms, six to nine windows, and central air and heat. The floors were covered with pink tile with each room having a 12-foot-by-14-foot rug for group activities. The rooms measured 868 square feet.

Sam Houston classrooms were approximately the same size, 657 square feet. There were eight windows in each room. The walls were constructed of brick and the floor was covered with green tile. Each classroom had a window air-conditioner for cooling.

The Red Bay lunchroom was located in a separate building and had central air conditioning and heating. The floors were terrazzo and the lighting was fluorescent. The lunchroom seated 420 students. There were five double windows on each side of the dining hall. The windows were low enough that students could see outside while they were eating. The lunchroom was clean and pleasing in appearance. Red Bay School had an easily accessible auditorium that seated 420 students and was in excellent condition.

The cafeteria at the Sam Houston School also served as an auditorium. Six large windows lined the exterior walls providing a view of the playground. Two window air-conditioning units provided cooling. A heavy maroon curtain separated the stage from the cafeteria. The tables in the cafeteria were crowded together. The noise level was high even though teachers worked at keeping the children quiet.

Restrooms at Sam Houston were approximately 330 square feet each. Separate restrooms were provided for girls and boys.

Restrooms at the Red Bay Elementary School were 225 square feet each. The floors were terrazzo, the fluorescent lighting was excellent, and there was a restroom located at each end of the hall. Boys have two restrooms and girls have two restrooms. The boys' restroom consisted of two wash basins, four urinals, and three commodes. The girls' restroom consisted of three wash basins and five commodes.

The elementary principal's office was located in the library, which was centrally located in the Red Bay Elementary School. The office measured 156 square feet and contained the following furniture: an executive desk and chair, a green carpet, a computer with cabinet, a large built-in bookcase, a small antique desk, a couch and matching chair, one extra chair, and a filing cabinet. The lighting was excellent and attached to the walls were two scenic pictures. The office had central air and heating.

The Sam Houston principal's office was located at the entrance to the building. The office was 168 square feet with large windows on each side that gave the principal a view of the entrance area and the playground. A window air-conditioner was located in one window. No information was available on the heating system.

The library at Red Bay Elementary School was in a central location. The library at Sam Houston Elementary School was located in a portable building. The portable building was separated from the main building.

Vina-Northside Schools. On entering the elementary school at Vina, one must turn left to gain access to the classrooms. A right turn leads to the elementary side of the library. The library separated the primary grades from the high school. The high school has a separate entrance. To gain access to the office complex, one must enter the high school entrance. The complex is on the right, near the entrance.

Persons who enter the front door of Northside Elementary School find themselves standing in a reception area. A hallway leads to the classrooms. To the left (east) was located the office complex. The reception area contained four matching upholstered chairs surrounding a coffee table.

The features of Northside Elementary School included floor covering, lighting, and hallways as follows:

1. The cafeteria floor was covered with asphalt tile. Carpet covered the rest of the floors throughout the building.
2. Lighting was cool-white fluorescent throughout the building. Adequate lighting prevailed throughout the building.
3. Hallways had adequate space. Floors were carpeted and ceilings were 9 foot with acoustic tile and fluorescent lighting flush with the ceiling.

The features of Vina Elementary School included the following:

1. Floor covering for the lunchroom was terrazzo. The floor was in good condition except at the entrance where the terrazzo had worn down to the concrete floor. All other areas except the hallways were carpeted. The hallways had a light gray tile.
2. Lighting for the entire building was fluorescent. The lighting was excellent with the exception of the lunchroom which appeared dim compared to the other areas.
3. Hallways were spacious. The ceilings were acoustic tile with fluorescent lighting that was flush to the ceiling. The floors were covered with a light gray tile and the walls were constructed of concrete blocks that were painted a light cream.

Vina's lunchroom was located in a separate building. The dining area seated 150 students. Windows were located on the north and south side of the dining room, two feet apart. The windows were rather large, 3 feet by 5 feet, and could be opened if desired. The lunchroom had central air and heat. Tables and chairs were arranged in four rows. The furniture was in fair condition. The kitchen was adequate in size and had red tile floors.

Northside Elementary School had a cafeteria that also doubled for a lunchroom, gymnasium, and auditorium. The floor was covered with asphalt tile. The walls were covered with pastel vinyl panels. No other information was available.

The administrative office space at Northside School consisted of an outer office waiting room composed of a glassed-in area, approximately 12 feet by 24 feet. Several chairs were available along the wall. Two reception desks and an 8 foot counter made up the office furnishings. Adjacent to the reception area was the principal's office.

The principal's office was spacious, measuring approximately 190 square feet. The office furnishings included: a couch with matching chair, a desk and chair, a 12-foot credenza, and a built-in computer cabinet. A private restroom completed the principal's office area. There were no windows in the office.

The administrative office space at Vina Elementary School consisted of an outer office that was located in an area measuring 90 square feet. There were no windows in the area. Brown carpet covered the floor in this area. The secretary sat at a nice executive-type desk with a work area on each side. A computer and printer, three filing cabinets, a bookshelf, and two matching chairs for visitors were located in this area.

There is a small hallway between the secretary's office and the principal's and assistant principal's offices. The complex, at Vina Elementary School, consisted of the secretary's office, the assistant principal's office, K-12 principal's office, a restroom, a workroom, and a storage room. The principal's office and the assistant principal's office were located side-by-side and both measured 255 square feet. Both offices were furnished basically the same with a couch and matching chair, a large executive desk with leather executive chair, a large wall cabinet for storage, a built-in bookcase, and two additional matching chairs. Two scenic pictures were placed on the walls.

The teacher lounges at both schools appeared to have about the same furnishings. The teachers in both areas use their lounge frequently and complained that sometimes they become crowded. Both lounges were well equipped for teacher use.

Summary of Findings Regarding Comparisons of Classroom Observations

Positive aspects: Rusk--Belgreen.

The following positive aspects apply to Rusk Elementary School:

Kindergarten:

1. The room was well decorated with the students' work and teacher-made items.

2. The classroom size was adequate.
3. Classroom lighting was adequate.
4. Classroom had central air-conditioning.
5. Adequate teaching materials were available.

First and Second Grades:

1. Classrooms had central air-conditioning.
2. The second grade had adequate classroom space.
3. The second grade had adequate classroom lighting.

The following positive aspects apply to Belgreen Elementary School:

Kindergarten:

1. The lighting was excellent.
2. The classroom was well decorated with the students' work and teacher-made items.
3. Learning centers, including a computer, were present, and central air and heat were available for the kindergarten.
4. The classroom was well organized and adequate teaching materials were available. Classroom space was adequate.

First and Second Grades:

1. Lighting in both classrooms was excellent.
2. Computers were present in both rooms.
3. Adequate teaching materials were available.
4. Ceilings and floors were in excellent condition.

5. Four foot paneling covered the walls of both rooms.
6. The students' work and teacher-made items were well displayed on the windows in the rooms and in the hallway.
7. Classroom space was adequate for the second grade.
8. There were five large windows in each room.

Positive aspects: Sam Houston--Red Bay.

The following positive aspects apply to Sam Houston Elementary School:

Kindergarten:

1. The classroom was well lighted.
2. The classroom was well decorated with the students' work and teacher-made items.
3. The classroom was well organized, and the noise level was low.
4. Classroom space was adequate.
5. There were restrooms inside the classroom that were equipped with wash basins.
6. Central air and heat was in the classroom.
7. Carpet covered the classroom floor, and adequate teaching materials were available.

First and Second Grades:

1. The classrooms had adequate lighting.
2. Both classrooms were well decorated with the students' work and teacher-made items.

3. The first-grade classroom was well organized.
4. The second-grade classroom contained a computer.
5. Adequate teaching materials were available for both classrooms.

The following positive aspects apply to Red Bay Elementary School.

Kindergarten:

1. The classroom had excellent lighting.
2. The classroom was well decorated with the work of the students and teacher-made items.
3. The room was well organized.
4. There was ample space for movement by the teacher and students.
5. The classroom noise level was low with good acoustics.
6. The classroom contained a restroom and wash basin.
7. The classroom had central air and heat that was controlled by each teacher.
8. Adequate teaching materials were in the classroom.
9. Learning centers including a computer and a television with VCR, and a built-in coat rack were present.
10. The kindergarten building was new and had a pleasing color scheme throughout the building.

First and Second Grades:

1. The classrooms had central air and heat.

2. The classrooms and hallways were well decorated with the students' work and teacher-made items.
3. The classrooms contained learning centers and computers.
4. Adequate teaching materials were available for both classrooms.
5. The classroom was exceptionally well organized in the first grade and well organized in the second grade.

Positive aspects: Northside--Vina.

The following positive aspects apply to Northside Elementary School.

Kindergarten:

1. The classroom was well organized.
2. The classroom was well decorated with the students' work and teacher-made items.

First and Second Grades:

1. Adequate teaching materials were available in the first grade.
2. A thermostat for controlling the temperature was located in the second grade classroom.
3. Both classrooms had adequate lighting.

The following positive aspects apply to Vina Elementary School.

Kindergarten:

1. The classroom was adequate in size, measuring approximately 792 square feet.
2. The classroom contained a built-in restroom with a wash basin.
3. The classroom was equipped with excellent lighting.
4. The classroom had learning centers and a computer.
5. The classroom had central air and heat that were controlled by the teacher.
6. Adequate teaching materials were available for the classroom.
7. Students had adequate storage areas.
8. The classroom and hallway were well decorated with the students' work and teacher-made items.
9. The classroom was well organized.
10. Adequate space for movement by students and the teacher was observed.
11. Carpet covered the floor in the classroom.

First and Second Grades:

1. Restrooms had carpet covering the floor.
2. Central air and heat was provided and was controlled by the teacher.
3. Students had adequate storage and work space in each classroom.
4. The classrooms were well organized by the teacher.

5. The classrooms and hallways were well decorated with the students' work and teacher-made items.
6. Student desks were excellent in design and appearance.
7. Classrooms were adequate in size measuring 840 square feet.
8. The six double windows were in excellent condition and provided a good view and ventilation for each room.
9. Classrooms were constructed with built-in restrooms and wash basins.
10. Learning centers, including a computer center, were available in each classroom.

Negative aspects: Rusk--Belgreen.

The following negative aspects apply to Rusk Elementary School.

Kindergarten:

1. Noise level was high due to vehicular traffic outside the building.
2. The classroom had uneven wooden floors from which varnish was peeling.
3. There was congestion when students moved between the tables.
4. A personal storage area for the teacher was almost non-existent.
5. Storage areas for materials were limited.

6. The classroom ceilings were 11 feet high, a feature which also contributed to the noise level.
7. Limited student work was displayed.

First and Second Grades:

1. Poor furniture arrangement was evident in both rooms.
2. The noise from outside vehicular traffic was very high.
3. Student movement between the desks was difficult and noisy in both classrooms. Teacher movement between desks was difficult.
4. The floor in the second grade needed repair.
5. The student desks were in poor condition in both rooms.
6. Varnish on the floors of both rooms was flaking and peeling.
7. Only two or three examples of student work were displayed in the second grade classroom.
8. The teacher and students needed more storage space for materials.

The following negative aspects apply to Belgreen Elementary School.

Kindergarten:

1. More storage space was needed for personal items and classroom materials.

2. The kindergarten class had to use the high-school restroom.
3. There was no water fountain except in the high-school science building.
4. The roof of the portable building made a loud cracking noise when the wind was high.
5. The porch and steps that were connected to the portable building were slick when wet.

First and Second Grades:

1. Student desks were easy to tip over and not suited for primary grades.
2. The noise level was high when students were going up and down the indoor stairs.
3. The noise level was high when students used the elementary gym for play during inclement weather.
4. The first grade teacher had so much furniture and materials that she needed more space in her room.

Negative aspects: Sam Houston--Red Bay.

The following negative aspects apply to Sam Houston Elementary School.

Kindergarten:

1. The windows provided no view and almost no natural lighting in the portable classroom building.
2. Storage space for the room was inadequate.
3. The classroom appeared rather small in size, measuring only 560 square feet.

First and Second Grades:

1. The rooms were noisy due to the sound of the window air-conditioner. Distraction and congestion were created by students visiting lockers located in the rear of the classroom.
2. The furniture arrangement was poor in the second grade classroom.
3. Students playing on the playground were a noise distraction in both classrooms.
4. The classroom for the first grade was too small.

The following negative aspects apply to Red Bay Elementary School.

Kindergarten:

1. A built-in storage area for the teacher's personal use was needed.

First and Second Grades:

1. The classrooms were too small.
2. Limited windows were a negative aspect in both classrooms.
3. The custodian failed to replace needed light bulbs in the classrooms.
4. There was no thermostat in each room for controlling the temperature.
5. Storage areas were inadequate for both classrooms.

Negative aspects: Northside--Vina.

The following negative aspects apply to Northside Elementary School.

Kindergarten:

1. The classrooms were too small.
2. Limited windows were a negative aspect in both classrooms.
3. Storage space for the classrooms was inadequate.
4. Additional areas for work materials were needed.

First and Second Grades:

1. The classrooms were too small.
2. The student desk area was congested, as were other areas in the first grade room.
3. Limited windows were a negative aspect in both classrooms.
4. More storage areas were needed for the first grade to store teaching materials.
5. Student work was not displayed in the second grade.
6. Resource materials for second grade students were limited. The teacher stated that she used the direct instruction method of teaching.

The following negative aspects apply to Vina Elementary School.

Kindergarten:

1. A built-in storage area for the teacher's personal use was needed in the classroom.

First and Second Grades:

1. A built-in storage area for the teacher's personal use was needed in both classrooms.

General Summary of Comparisons

A summary statement of the findings concerning the positive and negative aspects of the paired schools is provided below.

Rusk--Belgreen. The Belgreen School underwent a major renovation in 1984. The Rusk School appeared to have been left to deteriorate rather than undergoing needed major repairs. The classroom floors, walls, and ceilings at Rusk were inadequate for a positive learning climate. Both schools had a vehicular traffic problem. Both schools had an internal noise problem from student movement. The kindergarten class at Belgreen needed to be closer to the restrooms and water fountain. The Belgreen classrooms were better equipped (e.g., all rooms had computers) and the furniture was better arranged than at Rusk. Both schools had inferior desks for first- and second-grade classrooms. The classroom lighting was adequate for both schools. The teachers in Belgreen had more learning centers for their students to engage in various activities.

Sam Houston--Red Bay. Both kindergartens had many aspects in common. For example, both had good lighting, good classroom organization, low noise level, self-contained restrooms, central air and heat controlled by the teacher, adequate teaching materials, and classrooms well decorated with the students' work. The Red Bay first- and second-grade classrooms appeared too small, measuring from 528 to 568 square feet. Red Bay first- and second-grade classrooms and the kindergarten at Sam Houston had a limited number of windows. The windows provided no view and very little natural lighting at both schools. Red Bay school appeared to furnish their students with more electronic equipment than the Sam Houston school.

Northside--Vina. Northside and Vina kindergarten classrooms were well organized. Both classrooms (kindergarten) were well decorated with the students' work and teacher-made items. The first and second grade classrooms in both schools had adequate lighting. There were adequate teaching materials for the first grade at Northside school and for the first and second grade at Vina. These were the only areas observed that both schools had in common. The Northside school had a limited number of windows in all classrooms and the size of the classrooms was inadequate. Vina had adequate classroom size (792 square feet), built-in restrooms for all classrooms, learning centers, computers in all classrooms, and teacher controlled thermostats. All classrooms were well organized, with excellent desks and windows for the first and second grades. The second grade at Northside had no display of student work and resource materials for students were limited.

Summary of Findings Regarding Spatial Utilization Patterns for Paired Schools Based on Classroom Observations

The schools observed in this study were paired as follows:

Rusk Elementary--Belgreen Elementary

Sam Houston Elementary--Red Bay Elementary

Northside Elementary--Vina Elementary

To better understand the classroom spatial utilization of students the following tables are presented.

TABLE 4.13

Rusk Elementary School

	KINDERGARTEN			FIRST GRADE			SECOND GRADE		
Area	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/h by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use
A =	5%	5%	.002%	0%	0%	0%	13%	30%	1%
B =	84%	1824%	73%	100%	623%	90%	100%	1759%	88%
C =	43%	649%	26%	35%	42%	6%	100%	118%	6%
D =	5%	16%	.006%	33%	28%	4%	35%	93%	5%

* = Time of observation period that specific spaces were utilized.

A = Teacher's Desk Area

B = Student Desk Area

C = Open Area

D = Group Area

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TABLE 4.14

Belgreen Elementary School

	KINDERGARTEN			FIRST GRADE			SECOND GRADE		
Area	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use
A =	0%			0%			21%	28%	1%
B =	100%	1398%	67%	100%	668%	32%	100%	412%	21%
C =	100%	464%	22%	90%	532%	25%	100%	814%	41%
D =	62%	238%	11%	95%	901%	43%	95%	747%	37%

* = Time of observation period that specific spaces were utilized.

A = Teacher's Desk Area
B = Student Desk Area
C = Open Area
D = Group Area

The kindergarten students at Belgreen used Area D, the group area, more than Rusk students did. Both classes used Area B, the student desk area, the majority of the time.

The first and second grade students at Rusk had very little student movement. The Belgreen students interacted with Area C, the open area, and Area D, the group area, more than did the Rusk students.

The overall view of Table 4.13 and Table 4.14 indicates that Belgreen students had more movement and classroom area interaction than had the Rusk students.

Tables 4.15 and 4.16 present the observed Sam Houston and Red Bay K-2 grades in terms of spatial utilization patterns. Tables 4.17 and 4.18 present the observed Northside and Vina grades in terms of spatial utilization patterns.

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TABLE 4.15

Sam Houston Elementary School

	KINDERGARTEN			FIRST GRADE			SECOND GRADE		
Area	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use
A =	5%	12%	2%	25%	50%	2%	25%	40%	2%
B =	74%	927%	48%	100%	1575%	79%	100%	1610%	85%
C =	84%	726%	38%	25%	40%	2%	43%	170%	9%
D =	63%	225%	12%	55%	335%	17%	25%	80%	4%

* = Time of observation period that specific spaces were utilized.

A = Teacher's Desk Area C = Open Area

B = Student Desk Area D = Group Area

TABLE 4.16

Red Bay Elementary School

	KINDERGARTEN			FIRST GRADE			SECOND GRADE		
Area	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use
A =	25%	60%	3%	0%	0%	0%	14%	27%	1%
B =	62%	905%	38%	86%	1133%	57%	100%	1624%	75%
C =	75%	1175%	49%	62%	424%	19%	67%	268%	12%
D =	58%	260%	11%	95%	638%	29%	76%	259%	12%

* = Time of observation period that specific spaces were utilized.

A = Teacher's Desk Area C = Open Area

B = Student Desk Area D = Group Area

Table 4.15 reveals that during the time of the observation period, one or more students utilized specific spaces. Sam Houston students spent time in Area A, the teacher's desk area, at each grade level. Table 4.16 indicates that students in Red Bay used Area A, the teacher's desk area, only during the observation periods of the kindergarten and second grade at Red Bay. The use of Area B, the student desk area, was higher at the Sam Houston School, 79% to 85%, than the Red Bay School, 52% to 75%.

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The overall view of Table 4.15 and Table 4.16 indicates that Red Bay students had more classroom movement and interaction with Area C, the open area, and Area D, the group area, than did the Sam Houston students.

TABLE 4.17

Northside Elementary School

	KINDERGARTEN			FIRST GRADE			SECOND GRADE		
Area	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use
A =	20%	25%	1%	88%	242%	10%	.04%	18%	1%
B =	80%	1000%	50%	86%	1836%	73%	100%	1891%	79%
C =	70%	825%	41%	8%	15%	1%	48%	321%	13%
D =	50%	150%	8%	60%	442%	17%	.4%	161%	8%

* = Time of observation period that specific spaces were utilized.

A = Teacher's Desk Area C = Open Area

B = Student Desk Area D = Group Area

TABLE 4.18

Vina Elementary School

	KINDERGARTEN			FIRST GRADE			SECOND GRADE		
Area	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use	Area % C/R by one or more students*	Aggregate % of Area Use	Refined Aggregate % of Area Use
A =	10%	14%	1%	0%	0%	0%	0%	0%	0%
B =	29%	63%	3%	100%	1118%	53%	100%	756%	36%
C =	100%	889%	40%	90%	638%	30%	95%	500%	24%
D =	95%	1232%	56%	81%	341%	16%	100%	837%	40%

* = Time of observation period that specific spaces were utilized.

A = Teacher's Desk Area C = Open Area

B = Student Desk Area D = Group Area

One or more students at the Northside school at each of the observed grade levels spent time in Area A, the teacher's desk area (20%, 88%, and .04%). One or more Vina students at the kindergarten level spent only 10% of their

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time in Area A. The Vina first- and second-grade students spent 0% of their time in Area A.

The Northside students spent more time at their student desk area, Area B, than the Vina students (see Table 4.17 and 4.18). Vina students migrated to Area C and D more than the Northside students, consequently, the Vina students interacted more with all classroom areas than did Northside students.

Summary of Findings Regarding Compared Responses for Each of the Paired Schools

During the study process each researcher posed specific questions to school users regarding the schools which were analyzed. Each question related to how the facility impacted the learning climate. The following questions were presented at each school to several school users:

1. How does your building affect the learning climate of your school?
2. Would you please describe the most positive aspects of your campus?
3. What are the negative aspects of your campus?
4. Does the location of the campus enhance or inhibit the effectiveness of your school?
5. What would you do to your school if you had unlimited funds?

The following tables (Tables 4.19, 4.20, and 4.21) provide a summary of the responses from users at the schools targeted for comparison.

TABLE 4.19

Rusk and Belgreen Elementary Schools' Responses

<table>
<tr><th>RUSK ELEMENTARY</th><th>BELGREEN ELEMENTARY</th></tr>
<tr><td colspan="2">Question 1: How does your building affect the learning climate of your school?</td></tr>
<tr><td>1. Users generally felt that the Rusk facility negatively affected the learning climate.</td><td>1. The principal, teachers, and support personnel felt that the overall facility positively affected the learning climate.</td></tr>
<tr><td colspan="2">Question 2: Would you please describe the most positive aspects of your campus?</td></tr>
<tr><td>2. Adequate classroom lighting and large size of the classrooms were positive factors affecting the learning climate.</td><td>2. Renovation of Belgreen School in 1984 (new floors, lighting, plumbing, wiring, walls, ceilings, etc.). Recent renovation of the library. These are positive elements for an affective learning climate.</td></tr>
<tr><td colspan="2">Question 3: What are the negative aspects of your campus?</td></tr>
<tr><td>3. The two most negative responses were the floors and outside appearance of the school.</td><td>3. Shortage of classrooms and the noise level of children traveling up and down the stairs were the two most negative aspects.</td></tr>
<tr><td colspan="2">Question 4: Does the location of the campus enhance or inhibit the effectiveness of your school?</td></tr>
<tr><td>4. Users generally felt that the location of the campus negatively affected the learning climate.</td><td>4. Users struggled with this question; however, they ended up by stating the location had a positive affect on the learning climate.</td></tr>
<tr><td colspan="2">Question 5: What would you do to your school if you had unlimited funds?</td></tr>
<tr><td>5. The two most frequent answers were: Add carpet to the classrooms, and renovate the front of the building. Other answers were add flowers, shrubbery, and grass to the school yard.</td><td>5. The most frequent answers were: Build more classrooms, construct a new elementary gym, and add central air and heat.</td></tr>
</table>

Number of users responding at Rusk = 26
Number of users responding at Belgreen = 22

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TABLE 4.20

Sam Houston and Red Bay Elementary Schools' Responses

SAM HOUSTON ELEMENTARY	RED BAY ELEMENTARY
Question 1: How does your building affect the learning climate of your school?	
1. Users generally felt that the Sam Houston facility positively affected the learning climate.	1. The principal, teachers, and support personnel felt that the overall facility positively affected the learning climate.
Question 2: Would you please describe the most positive aspects of your campus?	
2. Users felt that the location of the campus and the design of the classrooms were the most positive aspects of Sam Houston.	2. The new kindergarten building and the central location of the auditorium and library were the most positive aspects to the users of Red Bay School.
Question 3: What are the negative aspects of your campus?	
3. The most negative aspects were that carpet was needed on classroom floors and the portable buildings needed to be replaced with permanent rooms.	3. Red Bay's most negative aspects were: first and second grade classrooms needed to be larger, and more classrooms needed to be constructed.
Question 4: Does the location of the campus enhance or inhibit the effectiveness of your school?	
4. Users felt that the facility's location positively affected the learning climate.	4. The principal, teachers, and support personnel felt that the Red Bay facility's location positively affected the learning climate.
Question 5: What would you do to your school if you had unlimited funds?	
5. Users felt that the most important items that they would fund were: carpet on all classroom floors, construction of more classrooms and library, and construction of parking areas for teachers, visitors, and administration.	5. Users felt the most important items they would fund were: enlargement of the classrooms in the pods and construction of additional windows, construction of more classrooms with built-in restrooms, and classrooms with half carpet, half tile floor for cleanliness and sanitation.

Number of users responding at Sam Houston = 23
Number of users responding at Red Bay = 30

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TABLE 4.21

Northside and Vina Elementary Schools' Responses

NORTHSIDE ELEMENTARY	VINA ELEMENTARY
Question 1: How does your building affect the learning climate of your school?	
1. Users generally felt that the Northside facility positively affected the learning climate.	1. The principal, teachers, and support personnel felt that the overall facility positively affected the learning climate.
Question 2: Would you please describe the most positive aspects of your campus?	
2. Users felt that cleanliness was the most positive thing about Northside's facility. Teacher and student displays on the walls also enhanced the learning climate at Northside.	2. The positive aspects for learning climate at Vina were: primary grades have self-contained restrooms, cleanliness of the facility, and a beautiful campus.
Question 3: What are the negative aspects of your campus?	
3. The negative aspects for Northside were: no gymnasium for the students, and classrooms are too small and have limited windows.	3. The negative aspects for Vina were: no auditorium for the elementary students, and they needed construction of more classroom designed like the primary classrooms.
Question 4: Does the location of the campus enhance or inhibit the effectiveness of your school?	
4. Users felt the facility location positively affected the learning climate.	4. The principal, teachers, and support personnel felt that the facility location positively affected the learning climate.
Question 5: What would you do to your school if you had unlimited funds?	
5. Users felt to enhance the learning climate, Northside needed to construct a gymnasium for the students. Additional classroom windows would also enhance the learning climate at Northside.	5. Construction of an auditorium and a separate gym for elementary students would enhance the learning climate. Construction of additional classrooms would enhance the learning climate. Additional playground equipment should be purchased for the school.

Number of users responding at Northside = 44
Number of users responding at Vina = 17

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Summary of Findings Between Paired Schools Regarding Teachers' Perceptions of Their Facility as Providing an Effective Learning Climate

The paired schools consisted of Rusk and Belgreen Elementary Schools; Sam Houston and Red Bay Elementary Schools; and Northside and Vina Elementary Schools. Composite comparison of schools using the teachers' perceptions regarding their school's facility are presented as percentages in tabular tables (Tables 4.22, 4.23, and 4.24). A narrative analysis of each table is provided.

TABLE 4.22

Composite Comparison of Rusk and Belgreen Teachers' Perceptions Regarding Their School Facility as Providing an Effective Learning Climate

	RUSK			BELGREEN		
Statements of Effective School Learning Climate	% YES	% NO	% SOMEWHAT	% YES	% NO	% SOMEWHAT
1. The exterior of a school should be pleasing in appearance.	29	29	43	75	0	25
2. The school facility contributes to the positive and negative attitude of teachers.	75	25	0	67	0	33
3. The facility allows for flexibility in teaching.	25	13	62	58	0	42
4. The facility contributes to a desire to continue teaching in the building.	14	14	71	42	0	58
5. The building and grounds provide a safe environment for students and teachers.	57	14	29	58	8	33
6. Large classroom size facilitates effective teaching.	50	20	30	33	33	33
7. The classroom promotes positive social interaction among students.	50	20	30	75	0	25
8. The classroom size allows for a wide variety of learning and teaching styles.	50	17	33	33	33	33
9. Classroom size restricts the movements of students and teachers.	13	63	25	42	17	42
10. Class size fosters a variety of teaching methodologies.	29	29	43	25	33	42
11. The organization and arrangement of the classroom fosters pride in students and parents.	57	29	14	58	0	42
12. The teacher maintains adequate control of the classroom physical environment.	67	17	17	83	17	0
13. The classroom accommodates the individuality of the student.	57	14	29	42	0	58
14. The classroom has ample storage areas for teacher materials.	9	64	27	42	33	25
15. Classroom storage areas do not occupy needed instructional space.	13	75	12	33	50	17
16. Classroom storage is used only for storing instructional materials.	50	33	17	67	25	8
17. Flexible walls and movable partitions enhance the effectiveness of instructional space.	14	71	14	8	92	0
18. Good school locations positively affect learning climate.	14	43	43	83	8	8
19. Well maintained school facilities promote positive learning environments.	57	29	14	75	17	8
20. The facility enhances the teacher's ability to perform in accordance with the goals and objectives of the district.	29	29	43	50	8	42

Number of teachers responding at Rusk:

N = 6 for Questions 8, 12, and 16

N = 7 for Questions 1, 4, 5, 10, 11, 13, 17, 18, 19, and 20

N = 8 for Questions 2, 3, 9, and 15

N = 10 for Questions 6 and 7

N = 11 for Question 14

Number of teachers responding at Belgreen: N = 12 to all Questions

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TABLE 4.23

Composite Comparison of Sam Houston and Red Bay Teachers' Perceptions Regarding Their School Facility as Providing an Effective Learning Climate

	SAM HOUSTON			RED BAY		
Statements of Effective School Learning Climate	% YES	% NO	% SOMEWHAT	% YES	% NO	% SOMEWHAT
1. The exterior of a school should be pleasing in appearance.	60	0	40	74	0	26
2. The school facility contributes to the positive and negative attitude of teachers.	60	0	40	74	4	22
3. The facility allows for flexibility in teaching.	25	0	75	33	37	30
4. The facility contributes to a desire to continue teaching in the building.	0	0	0	56	15	30
5. The building and grounds provide a safe environment for students and teachers.	40	0	60	67	7	26
6. Large classroom size facilitates effective teaching.	60	0	40	41	52	7
7. The classroom promotes positive social interaction among students.	80	0	20	78	7	15
8. The classroom size allows for a wide variety of learning and teaching styles.	80	20	0	26	70	4
9. Classroom size restricts the movements of students and teachers.	40	40	20	74	19	7
10. Class size fosters a variety of teaching methodologies.	60	20	20	19	56	26
11. The organization and arrangement of the classroom fosters pride in students and parents.	100	0	0	59	7	33
12. The teacher maintains adequate control of the classroom physical environment.	100	0	0	93	0	7
13. The classroom accommodates the individuality of the student.	80	0	20	22	44	33
14. The classroom has ample storage areas for teacher materials.	20	40	40	15	74	11
15. Classroom storage areas do not occupy needed instructional space.	20	60	20	37	37	26
16. Classroom storage is used only for storing instructional materials.	100	0	0	56	26	19
17. Flexible walls and movable partitions enhance the effectiveness of instructional space.	0	75	25	11	78	11
18. Good school locations positively affect learning climate.	100	0	0	81	7	11
19. Well maintained school facilities promote positive learning environments.	100	0	0	70	7	22
20. The facility enhances the teacher's ability to perform in accordance with the goals and objectives of the district.	60	0	40	52	7	41

Number of teachers responding at Sam Houston:

N = 4 for Questions 3, 11, and 17

N = 5 for Questions 1, 2, 5, 6, 7, 9, 10, 12, 13, 14, 15, 16, 18, 19, and 20

N = 0 for Question 4

Number of teachers responding at Red Bay: N = 27 on all Questions

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TABLE 4.24

Composite Comparison of Northside and Vina Teachers' Perceptions Regarding Their School Facility as Providing an Effective Learning Climate

	NORTHSIDE			VINA		
Statements of Effective School Learning Climate	% YES	% NO	% SOMEWHAT	% YES	% NO	% SOMEWHAT
1. The exterior of a school should be pleasing in appearance.	90	7	3	67	0	33
2. The school facility contributes to the positive and negative attitude of teachers.	90	3	7	67	0	33
3. The facility allows for flexibility in teaching.	71	4	25	67	11	22
4. The facility contributes to a desire to continue teaching in the building.	90	7	3	78	0	22
5. The building and grounds provide a safe environment for students and teachers.	90	7	3	78	0	22
6. Large classroom size facilitates effective teaching.	68	4	29	56	22	22
7. The classroom promotes positive social interaction among students.	80	7	13	89	0	11
8. The classroom size allows for a wide variety of learning and teaching styles.	59	4	37	22	22	56
9. Classroom size restricts the movements of students and teachers.	25	39	37	56	11	33
10. Class size fosters a variety of teaching methodologies.	64	4	32	11	11	78
11. The organization and arrangement of the classroom fosters pride in students and parents.	87	7	7	67	0	33
12. The teacher maintains adequate control of the classroom physical environment.	86	3	10	78	11	11
13. The classroom accommodates the individuality of the student.	73	7	20	33	22	44
14. The classroom has ample storage areas for teacher materials.	45	17	38	44	56	0
15. Classroom storage areas do not occupy needed instructional space.	75	4	21	89	0	11
16. Classroom storage is used only for storing instructional materials.	75	4	21	78	11	11
17. Flexible walls and movable partitions enhance the effectiveness of instructional space.	30	44	26	0	100	0
18. Good school locations positively affect learning climate.	87	7	7	89	0	11
19. Well maintained school facilities promote positive learning environments.	85	6	9	67	11	22
20. The facility enhances the teacher's ability to perform in accordance with the goals and objectives of the district.	90	7	3	56	0	44

Number of teachers responding at Northside:

N = 27 for Questions 8 and 17

N = 28 for Questions 3, 6, 7, 9, 10, 15, and 16

N = 29 for Questions 2, 12, and 14

N = 30 for Questions 1, 4, 5, 7, 11, 13, 18, and 20

N - 33 for Question 19

Number of teachers responding at Vina: N = 9 on all Questions

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Comparing Teachers' Perceptions

Rusk Elementary School and Belgreen Elementary School. Results of the instrumentation revealed that 75% of the teachers at Rusk School agreed with item 2 on the questionnaire. This was the most positive response on the questionnaire by Rusk teachers.

The two most positive responses (83% each) by Belgreen teachers were to items 12 and 18. Item 12, "the teacher maintains adequate control of the classroom physical environment," and item 18, "good school location positively affects learning climate," were the two most positive items.

The item that teachers selected as most negative at Rusk was item 14, "the classroom has ample storage area for teacher materials." The most negative item selected by teachers at Belgreen was item 17, "flexible walls and movable partitions enhance the effectiveness of instructional space." Item 17 received only 8% of the "yes" responses.

Sam Houston Elementary School and Red Bay Elementary School. All Sam Houston teachers (100%) agreed that their school adequately met facilities standards in their responses on five questionnaire items. These items (items 11, 12, 16, 18, and 19) are as follows: Item 11, "the organization and arrangement of classrooms foster pride in students and parents;" item 12, "the teacher maintains control of classroom;" item 16, "classroom storage is used only for storage of materials;" item 18, "good school location;" and item 19, "well-maintained school facilities promote positive learning." The most positive responses to items by Red Bay teachers were on statements 12 and 18 (93% and 81%). These items were noted as positively affecting learning climate.

The most negative responses by teachers at Sam Houston were for item 15, "classroom storage areas do not occupy needed instructional space," and item 17, "flexible walls enhance effectiveness of instructional space" (60% and 75%, respectively). The most negative responses that teachers gave at Red Bay were for item 14, "the classroom has ample storage areas for teachers," and item 17, "flexible walls enhance the effectiveness of instructional space" (74% and 78%, respectively).

Northside Elementary School and Vina Elementary School. Teachers at Northside responded positively to five items. Ninety (90%) percent expressed positive perceptions about the items. These items were item 1, "exterior of a school should be pleasing;" item 2, "the facility contributes to positive and negative attitude of teachers;" item 4, "the facility contributes to a desire to teach in the building;" item 5, "the building provides a safe environment;" and item 20, "the facility enhances teachers to perform in accordance with the goals and objectives of the district." The most positive items teachers selected at Vina were items 7, 15, and 18 (each had 89% "yes"). Item 7 is "classroom promotes positive social interaction among students;" item 15 reads "classroom storage does not occupy instructional space;" item 18 is "good school location positively affects learning climate."

The most negative item responses by teachers at Northside were items 9 and 17 (39% and 49% "no," respectively). Item 9 is "classroom size restricts movement of students and teachers," and item 17 is "flexible walls enhance the effectiveness of instructional space." The most negative response by teachers at Vina was item 10 (11% "yes"). Item 10 is "classroom size fosters a variety of teaching methodologies."

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to observe, record, and describe the interface between educational facilities and learning climate in three northern Alabama K-2 elementary schools. A second purpose of the study was to compare and contrast the results of the research completed by Lowe (1990) that was entitled "The Interface Between Educational Facilities and Learning Climate in Three Elementary Schools." The research utilized approaches and instrumentation that were similar to those employed in the Lowe study.

The study employed a naturalistic design which necessitated observations of the interaction of users of a school with the physical characteristics. A key element of the study was to determine if there was an interface between the educational facilities targeted for study and the learning climate.

The following research questions were posed to guide the research.

1. What are the users' perceptions of the impact of their school's physical characteristics on the learning climate?

2. What are the teachers' perceptions of the extent to which their school's physical characteristics meet stated criteria for an effective learning climate based on the following standards?

   a. Illumination
   b. Noise
   c. Color
   d. Thermal Environment
   e. Space
   f. Location
   g. Maintenance
   h. Esthetics
   i. Safety

3. How do the reactions and behaviors of students and teachers compare and contrast in education settings that are located in two distinct regions of the United States?

This study was conducted to provide usable data to persons responsible for the planning, design, and utilization of school buildings. The study focused on the relationship between facilities and the learning climate of the classroom. Results from this research will allow responsible persons in education to design and construct educational facilities that enhance the learning climate of the school. The remainder of this chapter presents the summary, findings, conclusions, and recommendations resulting from the study.

Summary

The study began in September, 1992, when criteria for selecting the three elementary school campuses in which to conduct the inquiry were developed. Three schools in the Franklin County School System, in Alabama, were chosen for the study. The study followed primarily the naturalistic inquiry method of research; however, two paper and pencil instruments that were developed by Lowe (1990), and modified for this study, were utilized to enhance and expand the data base and subsequent information generated by this study.

The on-site study occurred over a period of three months during the winter of 1993. During this period the researcher conducted 21 on-site visits to each of the three North Alabama campuses. Interviews, both unobtrusive and informal, were conducted with teachers, administrative staff, and support personnel during this period. Three formal classroom observations were carried out on each campus using a modified version of the Classroom Spatial Utilization and Migration Form developed by Lowe (1990). Results obtained from the use of this instrument verified Silverstone's (1981) findings that implied crowding will adversely affect free movement in the classroom and will have a negative impact upon the learning climate. Classrooms where the arrangement of desks and learning centers appeared to restrict the movement of teachers and students revealed less teacher interaction with students and more lecture or direct instruction rather than free movement to learning centers. Rooms that were large enough for teachers to arrange for free movement between student desks yellow vinyl panels" (p. 153). Lowe further wrote that the walls were easy to keep clean.

The teachers at Red Bay and Vina perceived their schools to have color schemes that attributed to an effective learning climate. The majority of teachers at Belgreen School perceived their school color scheme as having a negative impact on the learning climate by responding 33% "yes," 42% "no," and 25% "somewhat."

Research Question 3. How do the reactions and behavior of students and teachers compare and contrast in education settings that are located in two distinct regions of the United States?

1. Instructional techniques utilized by teachers appeared to be similar in the classroom settings. Teaching at all schools employed small group, lecture, individualized, and other similar techniques of instruction.
2. Student migration and spatial utilization patterns in the Alabama schools revealed a greater range of movement among students than in the Texas schools (see Tables 4.13 through 4.18).
3. The deviation in the movement of students was influenced by the type of equipment in the classrooms.

6. A review of the Lowe study (1990) revealed that during interviews and observations, noise was *determined to have a negative impact* at the Rusk and Sam Houston Schools. The elimination of noise at the Northside School was such that a positive learning climate prevailed. Two schools in Alabama did not meet the criteria for noise level that would be acceptable for a positive learning climate. These two schools are Belgreen and Red Bay. The majority of teachers in both schools responded "yes" (17% at Belgreen and 11% "yes" at Red Bay) and said that their school met a positive learning climate standard regarding proper acoustics to eliminate noise. The majority of teachers at Vina responded that their school met the desired requirements for a positive learning climate concerning noise.
7. The Lowe study (1990) did not reveal any positive or negative aspects regarding the color schemes of Rusk and Sam Houston schools, other than the observation that Rusk's floors had flaking varnish. The Lowe study (1990) suggested that Northside had a positive color scheme for an effective learning climate by stating: "The walls throughout the building were covered with pastel

   f. A majority of teachers at all schools except the Rusk Elementary School perceived that their schools' physical location met stated criteria for an effective learning climate.

2. A review of statements regarding space (including storage) revealed that space presents problems in each of the six schools. Although there was adequate floor space in some classrooms, storage presented a problem at all facilities.

3. A majority of teachers at each of the three Alabama schools revealed that illumination met stated criteria for an effective learning climate. A review of the Lowe study (1990) also revealed that during interviews and observations illumination was determined to be adequate.

4. A majority of teachers and five of the six schools targeted for this study revealed that the general esthetics of their building met the criteria for an effective learning climate. A majority of teachers at Rusk did not respond "yes" to this item.

5. A majority of teacher respondents at all six schools perceived that their schools' maintenance met the required criteria for an effective learning climate.

e. Space
f. Location
g. Maintenance
h. Esthetics
i. Safety

1. Teachers presented varying views regarding the extent to which various physical characteristics met criteria for an effective learning climate based on nine specific standards.

    a. A majority of teachers at Rusk and Belgreen perceived that the standards regarding thermal environment were not met by their schools.

    b. A majority of teachers at Sam Houston and Red Bay shared the same positive perceptions.

    c. Teachers at Northside and Vina also perceived that thermal environment standards were adequately met at their schools.

    d. A majority of teacher respondents at all six schools perceived that their schools' physical characteristics provided a safe environment. One school (Sam Houston) showed a response rate of 40% "yes" in response to this question; however, no teacher responded "no" to this item, while 60% responded "somewhat."

    e. A clear majority of teachers, at all other schools surveyed, responded "yes" to items relative to safety.

from the teacher's perception questionnaire support this finding (a total of 68% of the teachers from Vina responded "yes" to items while 75% of the teachers at Northside responded "yes").

Findings Related to Research Questions

The following findings were revealed relative to each of the research questions posed in the study.

Research Question 1: What are the users' perceptions of the impact of their school's physical characteristics on learning climate?

1. Based on interviews and observations the users' perceptions of the impact of their school's physical characteristics on the learning climate were positive in all three Alabama schools.
2. The analysis of descriptive data also revealed that users at all three Alabama schools perceived the impact of their school's physical characteristics on the learning climate was positive.

Research Question 2: What are the teachers' perceptions of the extent to which their school's physical characteristics meet stated criteria for an effective learning climate based on the following standards as identified by Castaldi (1977)?

a. Illumination
b. Noise
c. Color
d. Thermal Environment

The Rusk facility negatively impacted the learning climate while the Belgreen facility positively impacted the learning climate.

A review of the observations, statements, the perception questionnaire (51% of the teachers from Belgreen responded positively to statements while only 38% of Rusk teachers responded positively), interviews, and the classroom migration patterns revealed that the Belgreen facility has a positive impact on learning climate while the Rusk facility does not.

2. Both the Sam Houston and Red Bay facilities proved to provide a positive interface between the facility and the learning climates. Evidence from observations, interviews, the review of spatial migration, and the compilation of results from the teacher's perception questionnaire (a total of 49% of Red Bay teachers responded "yes" and 22% responded "somewhat" while 68% of Sam Houston teachers responded "yes") revealed that both of these facilities had a positive interface between the facility and the learning climate.

3. Both the Northside and Vina schools had a positive interface between the facility and the learning climate. Observations, interviews, a review of spatial migration, and the compilation of results

16. The custodian at Vina Elementary School appeared to be well-liked and respected by teachers and students. This appeared to have a positive impact on the learning climate.

17. The walkways to the gym and music room did not have overhead covers. This appeared to have a negative impact on the learning climate.

18. The Vina school was located in a beautiful 26-acre rural setting that enhanced the learning climate of the school.

19. Vina has an excellent traffic pattern for the school area.

20. Adequate teacher and visitor parking was provided in an expansive parking lot near the entrance of the school.

21. The parent pick-up zone is located by a covered walk at the turn-around circle. At the main entrance of the elementary school on the opposite side of the building (south) from the parent pick-up zone was located the bus loading and unloading zone.

22. The traffic pattern for parents, teachers, and buses was designed with safety in mind.

Findings Related to Paired School Comparisons

1. The facilities at Belgreen and Rusk were found to have an opposite impact on the learning climate.

7. The design of the building was for energy savings and appeared functional and accommodating.
8. The well-landscaped entrance to the building and the hallways decorated with each child's name by the door was appealing and inviting.
9. The number and size of classroom windows enhanced the learning climate of the school.
10. The building's overall square footage appeared to have a positive impact on learning climate.
11. The organization of the classrooms seemed to also have a positive impact; movement within the classrooms was free and easy for students and teachers.
12. The classrooms had excellent desks and chairs in the first and second grades. Teachers appeared well pleased with adjustable desks that could accommodate right- or left-handed students.
13. The furniture in classrooms at Vina was in excellent condition, a feature which appeared to have a positive impact on the learning climate.
14. Building maintainability appeared to have a positive impact on learning climate at Vina Elementary School.
15. The building was clean and well maintained. The day-to-day custodian seemed to be effective in keeping the facility clean and attractive.

group areas, time-out areas, and the teacher desk area in all observed classrooms had a positive impact on the learning climate. The movement of children across a parking lot to the lunchroom and the playground appeared to have a negative impact on the learning climate.

Vina Elementary School

1. Results from the study indicated that the physical characteristics of Vina Elementary School had a positive impact upon the learning climate of the school.
2. Building age did have a positive impact upon the learning climate.
3. Teachers, administrators, and support personnel were proud of their new building and took pride in its maintenance.
4. The central air and heating provided a positive factor that contributed positively to the learning climate.
5. Excellent lighting, carpet on all classroom floors, and classroom-contained restrooms and sinks were all positive features of the Vina Elementary School that contributed to a positive learning climate.
6. The exterior of the building and grounds were well maintained and pleasing.

4. Red Bay Elementary had a well-designed and equipped auditorium under the same roof as the elementary school. Having an easily accessible auditorium appeared to have a positive impact on the learning climate.

5. The square footage of the classrooms in the main building appeared to have a negative impact upon the learning climate of the school. Due to limited space, teaching methodologies had to be altered to the extent that individual attention to students appeared to be restricted.

6. The main building appeared well maintained and seemed easy to care for, with the exception of replacing light bulbs. The library, two classrooms, and one hallway needed bulbs replaced.

7. The classrooms, which teachers were responsible for cleaning, were in excellent condition.

8. The classrooms in the main building were designed to form pods. Windows were limited; only one or two small windows were available in each room. When a couple of lights were out, the lighting in these rooms was dim.

9. The lack of windows in the pods had a negative impact on the learning climate of the school.

10. The organization of the desks or tables, learning centers, materials, bookshelves, small and large

became more evident as the study progressed. The color scheme of the building appeared to have a negative impact on the learning climate. One teacher stated, "It is monotonous."

6. Maintenance at the Belgreen Elementary School building seemed to produce a positive learning climate in the school. The building exterior and grounds appeared pleasing and seemed to enhance a positive view of the campus.

Red Bay Elementary School

1. Results from the study indicated that the physical characteristics of Red Bay Elementary School had a positive impact upon the learning climate of the school. While the thermal environment had a positive impact upon the learning climate, design and flexible classroom walls appeared to have a negative impact.
2. The new kindergarten building with classroom restrooms, sinks, pink tile floors, expansive windows, and excellent lighting appeared to enhance the learning climate of the Red Bay Elementary School.
3. The centrally located library with its latest electronic equipment, well-stocked bookshelves, and a full-time librarian had a positive impact upon the learning climate of the school.

2. The noise level was high from within the building. Elementary students going to lunch, the playground, and the music room had to go up and down a steep flight of stairs. This created a noise and safety problem that had a negative impact upon the learning climate of the school. Another noise problem that had a negative impact was the use of the elementary gym for play during inclement weather. Almost all elementary classes were affected by the noise.
3. The location of one kindergarten class had a negative impact on Belgreen school. It was located in a portable building with no water or restroom. Kindergarten students had to use water and restroom facilities from the high school which was located nearby.
4. A major problem that negatively impacted the Belgreen campus was Highway 187. The highway that passes through the Belgreen campus results in separation of the campus. This created traffic problems for parking vehicles and loading and unloading buses.
5. Evidence gathered during the study suggested that the overall square footage of the facility had a somewhat negative impact upon the learning climate of the school. The shortage of storage space

that climate consisted of "conditions which to some degree affect one's daily activity or routine" (p. 13).

Descriptive case studies as prescribed by Guba and Lincoln (1981), Lincoln and Guba (1985), and Owens (1991) incorporating the results of observation, interviews, and instrumentation were written for each of the three campuses participating in the study. These descriptive reports appear in Chapter IV in this record of study. The descriptive analysis and findings presented in Chapter IV led to numerous conclusions regarding the impact of school facilities upon learning climate. The findings, conclusions, and recommendations that appear most significant to the study are presented on the following pages.

Findings

Belgreen Elementary School

1. Results from the study indicated that the physical characteristics of Belgreen Elementary School had a positive impact upon the learning climate of the school. The covered walkways lined with concrete benches, large shady oak trees, the original white globed lighting fixtures, shrubbery, and neatly trimmed grass added to the positive learning climate. The illumination of the school received a very high positive reaction from the Belgreen teachers.

or tables, and small group areas, provided a better learning climate. Rooms which provided large group areas also provided adequate space for a positive learning climate. Rooms where student and teacher movement was unrestricted appeared to display a sense of positive learning.

The heating and cooling elements within the classroom seemed to impact the learning climate. Observations revealed that rooms which allowed the teacher to control the comfort zone appeared to enhance a positive learning climate.

Teacher perceptions were assessed by use of the Teacher's Educational Facility Perceptions Questionnaire. Perceptions obtained from this instrument were consistent with Hanlon's (1979) findings. He wrote that planned and unplanned learning are due to the teacher's effectiveness in improving the classroom climate. Hanlon (1979) continued by asking: "How much more effective could a teacher be if the importance of the classroom climate were acknowledged, understood, and expanded to include those sensory, intuitive, and subconscious experiences that influence human behavior subtly, but surely, in many ways every day?" (p. 89). Results of the questionnaire concluded that teachers on the Belgreen, Red Bay, and Vina campuses perceived their schools as having a positive impact upon the learning climate. These teachers' perceptions are in accordance with Baskerville's (1981) findings. He wrote negatively impact the learning climate at a school.

3. Teachers have specific preferences regarding the safety, esthetic, instructional, and equipment features of their classrooms and should therefore be involved in the development of educational specifications when renovation or new construction is necessary
4. Architectural features and general schematic arrangements relative to the physical location of a school can affect the learning climate in the specific area of safety and esthetics.
5. The "pod" (open space) architectural design negatively impacted the learning climate in the areas of comfort and space in the two regions targeted for this study.
6. Student movement in a classroom and school facility is impacted by available space, learning centers, equipment, and other materials.
7. Space on the outside of a building must be properly allocated for the ingress and egress of vehicles and the loading and unloading of pupils to ensure a safe environment during the entire school day and year.
8. There was more than adequate evidence to indicate that there is a relationship and interface between

4. The number of learning centers had an impact on the frequency of student movement and space utilization.
5. Teachers at Rusk and Belgreen differed in their reactions as to how the facility positively impacted learning climate. Although teachers at these centers differed (with Belgreen teachers demonstrating a more positive attitude), teachers at all other schools shared similar views.
6. Schools constructed in both states which utilized a "pod" type architectural design presented space and comfort problems for students. Administrators at the Texas school (Northside) had renovated to correct the problem and the principal of the Alabama school (Red Bay) expressed a desire to renovate to eliminate the "pod" or open space and limited window design.

Conclusions

The following conclusions have been developed as a result of this research.

1. A school facility has a definite impact on the total learning climate.
2. Specific physical features such as space, equipment, maintenance, appearance, comfort, and general physical arrangement may positively or

the facilities and learning climate in all schools used in the research.

Recommendations for Improvement

The following recommendations have been stated relative to steps which can be implemented to improve the facilities at the three North Alabama schools.

Recommendations for Belgreen Elementary School

Recommendation: Place flashing yellow lights at north and south entrances to the school grounds on Highway 187.

Rationale: Having yellow flashing lights 7:30 - 8:30 a.m. and 2:30 - 3:30 p.m. and also posting 15 MPH speed limit signs will reduce traffic hazards. Enforcement support from the state and county is desirable.

Recommendation: Relocate library to the elementary gym and use library building for snack time and elementary gym.

Rationale: The library is detached from the main building and the gym is centrally located between the high school and the elementary school. The gym is located in a low noise area and should be reevaluated for renovation into a library.

Recommendation: Cover sidewalks utilized by elementary students.

Rationale: Elementary students must go outside the main building to the auditorium and to music class. A covered walk is needed during inclement weather in order to allow the students to reach these areas.

Recommendation: Install central air and heating for the elementary school.

Rationale: Central air-conditioning and heating would eliminate the steam radiators that are difficult for teachers to regulate. Also, the window air-conditioners that produce noise need to be removed.

Recommendation: Change the interior colors.

Rationale: Belgreen has the same color design throughout the building. The lighting is excellent, partly due to the color scheme; however, the same color becomes monotonous. Perhaps a few murals, some red, yellow, or orange would break the color scheme.

Recommendations for Red Bay Elementary School

Recommendation: Renovate the pods in the elementary school.

Rationale: Construct a wall down the center of each pod, making two classrooms instead of three.

Recommendation: Construct more windows in the pod classrooms.

Rationale: After renovation of the pods, install solid windows across the north side of the north pods and solid windows across the south wall of the south pods.

Recommendation: Construct a 1-3 grade classroom.

Rationale: Using the parking lot between the elementary school and the snack room, construct a 1-3 grade building based upon the design of the kindergarten. This will still leave a centrally located library and auditorium. In addition, construct a teachers' parking lot behind the snack room area. Stop parents from dropping off children behind the buses and force them to use the north side pick-up zone.

The new building would assist in this effort by blocking off what is now their turn-around area.

Recommendation: Provide an in-service program for custodians.

Rationale: An in-service or orientation program would provide information on the importance of teacher and student relationships with the custodian. It would provide information on scheduling work and anticipating the need of supplies (e.g., light bulbs).

Recommendations for Vina Elementary School

Recommendation: Construct two K-2 classrooms.

Rationale: Due to overcrowding, one kindergarten class was instituted and had to be set up in the upper elementary building. By adding two classrooms to the primary building, the disparity in age groups would be eliminated and solve problems due to future expansions in enrollment.

Recommendation: Build an add-on for K-2 classrooms.

Rationale: It appears, with a little excavation, that by turning north 180 degrees, the two classrooms could be connected to the east end of the first- and second-grade rooms. The library would still be easily accessible and travel to the lunchroom, playground, and gym would follow the same route.

Recommendation: Install covers for sidewalks.

Rationale: Two areas that need covers for sidewalks for elementary children are the walkway leading to the gym and the walkway leading to the music room.

Recommendations for Further Study

1. A study should be conducted to determine if there is an interface between the physical facility and pedagogical techniques employed by teachers. Such a study could provide insight into issues surrounding the impact of illumination, space, and general esthetics on teachers' approach to instruction. This type study could also give school design experts some idea of how to allocate certain space within the actual teaching areas of the classroom.

2. A study should be conducted in secondary schools to determine if there is an interface between the physical facility and learning climate.
3. A study should be conducted to determine if school architects and school administrators differ in their perceptions as to the relationship between the physical facility and learning climate.
4. A similar study should be conducted to determine if schools constructed during ten-year periods impact the positive or negative aspects of the learning climate. Since the life-span of a school has been determined to be about 50 years, it would be helpful to conduct interface studies, such as the one investigated in this research, to cover shorter spans of time. Results of such studies would assist school designers to alter plans appropriate to meet the needs of children.

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APPENDIX A

LETTER TO THE SUPERINTENDENT OF FRANKLIN COUNTY SCHOOLS REQUESTING PERMISSION TO CONDUCT STUDY

Rt. 3, Box 48
Phil Campbell, Al. 35581

September 16, 1992

Superintendent of Education
Franklin County Schools
P.O. Box 610, 500 North Coffee
Russellville, Alabama 35653

Dear Mr. Dillard:

I wish to conduct a study to determine the interface between educational facilities and learning climate in three elementary schools, grades k-2. The research will be an attempt to gain insights into the question posed below:

> How do the following physical characteristics of the facility impact the learning climate of the school?
>
> 1. Building age
> 2. Building design and appearance
> 3. Building square footage
> 4. Size and organization of instructional space
> 5. Building maintainability
> 6. Location

My study is being directed by Dr. Harold L. Bishop, professor of Educational Administration, at The University of Alabama.

I respectfully request, with permission of the Franklin County Board of Education, the opportunity to conduct this study utilizing three of the six schools in the Franklin County Alabama school system.

Sincerely,

AC Yielding

A C Yielding

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APPENDIX B

LETTER FROM SUPERINTENDENT OF FRANKLIN COUNTY SCHOOLS GIVING APPROVAL TO CONDUCT STUDY

Hoyt Dillard
SUPERINTENDENT

Gerald Hester
Chairman

Bobby Bolton
Vice-Chairman

Ralton Baker
Member

Greg Beasley
Member

Charles Hardin
Member

BOARD of EDUCATION
FRANKLIN COUNTY
P.O. Box 610 500 NORTH COFFEE
RUSSELLVILLE, ALABAMA 35653
(205) 332-1360

September 24, 1992

Mr. A. C. Yielding
Route 3 Box 48
Phil Campbell, AL 35581

Dear Mr. Yielding,

The Board of Education, in regular session on this date, approved your request to use three of our elementary schools, K-2, in your doctorial program studies.

A.C., when you select the three schools that you would like to use in your studies please advise me in writing.

Sincerely,

Hoyt Dillard

Hoyt Dillard, Superintendent

HD/hh

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APPENDIX C

CLASSROOM SPATIAL UTILIZATION AND MIGRATION FORM

CLASSROOM SPATIAL UTILIZATION AND MIGRATION OBSERVATION FORM

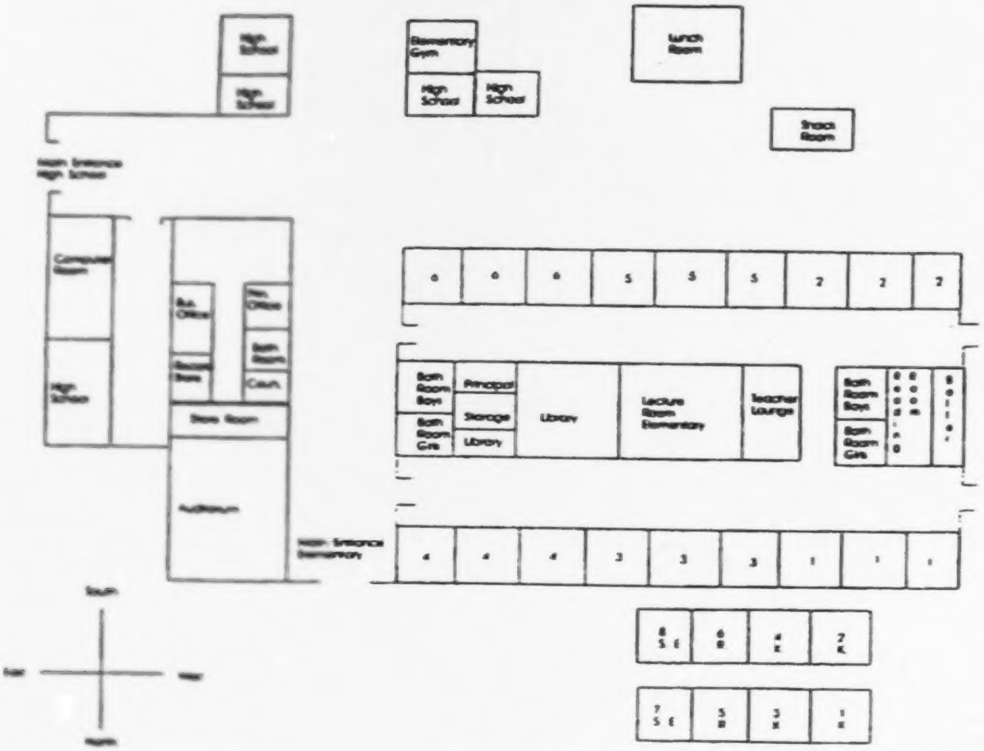
SCHOOL: ______________________________

DATE: ________ TIME: ________ GRADE: ________

NUMBER OF TEACHERS: ________ AIDES: ________

NUMBER OF STUDENTS: ________

LOCATION OF SPACE USED IN THIS OBSERVATION:


High School
High School
Elementary Gym
High School
High School
Lunch Room
Snack Room
Main Entrance High School
Computer Room
High School
Bus. Office
Bath Room
Store Room
Auditorium
Main Entrance Elementary
Bath Room Boys
Bath Room Girls
Principal
Storage
Library
Library
Lecture Room Elementary
Teacher Lounge
Bath Room Boys
Bath Room Girls
6
6
6
5
5
5
2
2
2
4
4
4
3
3
3
1
1
1
South
East
West
North

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PHYSICAL CHARACTERISTICS

CLASSROOM
_____Traditional _____Modified _____Open

_____Square Feet _____Ceiling Height

_____Appearance (good) 1, 2, 3, 4, 5 (poor)

WINDOWS
_____None _____Number
_____Operable
_____Inoperable
_____Distracting Glare
_____Size (Panes)
_____Location (N, S, E, W)

LIGHTING
_____Bright _____Drop _____Full-Space
_____Normal _____Indirect _____Cool/White Fluorescent
_____Dim _____Recessed _____Diffused

FLOOR COVERING
_____Color _____Carpet _____Tile _____Wood
_____Concrete _____Other

WALL COVERING
_____Color _____Plaster _____Tile _____Wood
_____Paneling _____Fabric _____Brick _____Other

TEACHER PROFESSIONAL STORAGE
_____Closet _____Shelves _____Bins _____Other

STUDENT PERSONAL STORAGE
_____Closet _____Shelves _____Bins _____Desks
_____Tables _____Other (Lockers)

MATERIAL STORAGE
_____Closet _____Shelves _____Bins _____Other

HEATING/COOLING _______________Type
LOCATION
_____Ceiling Unit _____Window Unit _____Floor Unit
_____Radiator _____Comfort Zone (cold) 1, 2, 3, 4, 5 (hot)

FURNITURE
SHELVING/STORAGE
_____Built-in _____Free Standing _____Fixed
_____Moveable _____Obstruction (no)

STUDENT WORK AREAS
_____Personal Desks _____Small Tables _____Large Tables
_____Straight Chairs _____Lounge Chairs _____Study Carrels

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TEACHER WORK AREAS

_____Teacher Desk _____Tables _____Other

CONDITION

_____(new) 1, 2, 3, 4, 5, (poor)

SPATIAL CHARACTERISTICS

TEACHER DESK AREA

_____Square Feet _____Percent (%)
_____Large Group Space _____Percent (%)

STUDENT DESK AREA

_____Square Feet _____Percent (%)
_____Large Group Space _____Percent (%)

SMALL GROUP AREA

_____Square Feet _____Percent (%)
_____Other _____Percent (%)

APPENDIX D

TEACHER'S EDUCATIONAL FACILITY PERCEPTION QUESTIONNAIRE
DEVELOPED BY JERRY LOWE (1989)

STATEMENTS OF EFFECTIVE SCHOOL LEARNING CLIMATE	YES	NO	SOMEWHAT	EXPLAIN
16. Classroom storage is used only for storing instructional materials.				
17. Flexible walls and movable partitions enhance the effectiveness of instructional space.				
18. Good school locations positively affect learning climate.				
19. Well maintained school facilities promote positive learning environments.				
20. The facility enhances the teachers ability to perform in accordance with the goals and objectives of the district.				
21. Illumination (lighting) provides for adequate visual environment in the classroom.				
22. Proper acoustics prevail thereby eliminating unnecessary noise.				
23. Classrooms are located in areas which insure the elimination of noise which could contribute to an unpleasant climate.				
24. Color schemes enhance the esthetics of the building.				
25. The thermal environment contributes to the maximum comfort of students.				
26. The building and grounds have a pleasant appearance which is esthetically pleasing.				

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TEACHER'S EDUCATIONAL FACILITY PERCEPTION QUESTIONNAIRE

©Jerry M. Lowe, 1989

INSTRUCTIONS: Current research in school facility design indicates that the statements below are positive criteria that contributes to effective school learning climates.

Please indicate if your school facility measures up to the criteria in each statement by checking yes, no, or somewhat. Please explain your answer in a brief sentence.

STATEMENTS OF EFFECTIVE SCHOOL LEARNING CLIMATES	YES	NO	SOMEWHAT	EXPLAIN
1. The exterior of a school should be pleasing in appearance.				
2. The school facility contributes to the positive and negative attitude of teachers.				
3. The facility allows for flexibility in teaching.				
4. The facility contributes to a desire to continue teaching in the building.				
5. The building and grounds provide a safe environment for students and teachers.				
6. Large classroom size facilitates effective teaching.				
7. The classroom promotes positive social interaction among students.				
8. The classroom size allows for a wide variety of learning and teaching styles.				
9. Classroom size restricts the movements of students and teachers.				
10. Classroom size fosters a variety of teaching methodologies.				
11. The organization and arrangement of the classroom fosters pride in students and parents.				
12. The teacher maintains adequate control of the classroom physical environment.				
13. The classroom accommodates the individuality of the student.				
14. The classroom has ample storage areas for teacher materials.				
15. Classroom storage areas do not occupy needed instructional space.				

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Signature: Mrs A.C. Yielding	Printed Name/Position/Title: Mrs. A.C. Yielding, widow of author	
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